FEBRUARY 11, 1961

Chemical Week

A McGRAW-HILL PUBLICATION PRICE FIFTY CENTS

Sales up, profits down—that's the '60 story revealed by year-end report round-up . p. 21

CARY'S BLASIUS: HE'S BETTING BIG ON PVC'S POTENTIAL . . . . p. 23

Chemical copper gets go-ahead. Pioneer plant due for Philippines . . . . p. 35

Halogenated polymers are new target of international research . . . . . p. 53

La Maur wins first round

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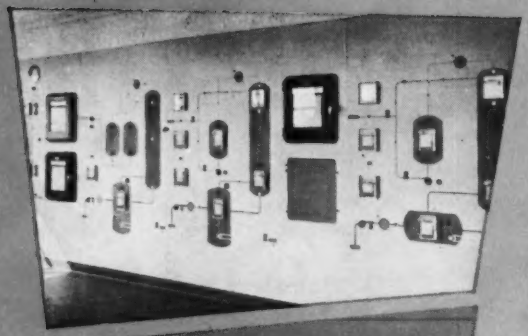

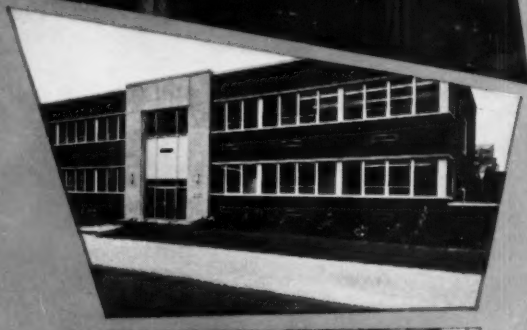

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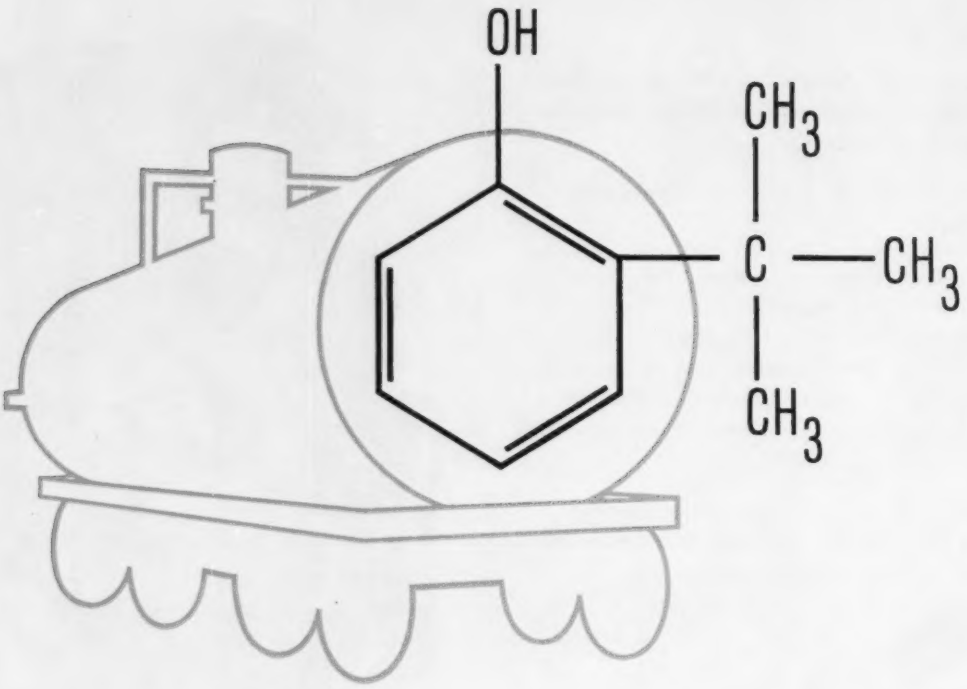

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ON THE COVER: George Blasius, president of Cary Chemicals, sees 1.5-billion-lbs./year market for polyvinyl chloride within five years—and he wants a big share of it for Cary (p. 23).

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Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Telephone, LO 4-3000; Teletype, TWX N. Y. 1-1636; Cable, McGRAWHILL, N. Y. Place of publication: Philadelphia, Pa. Second class postage paid at Philadelphia. (See below for directions regarding subscriptions or change of address.) OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office,

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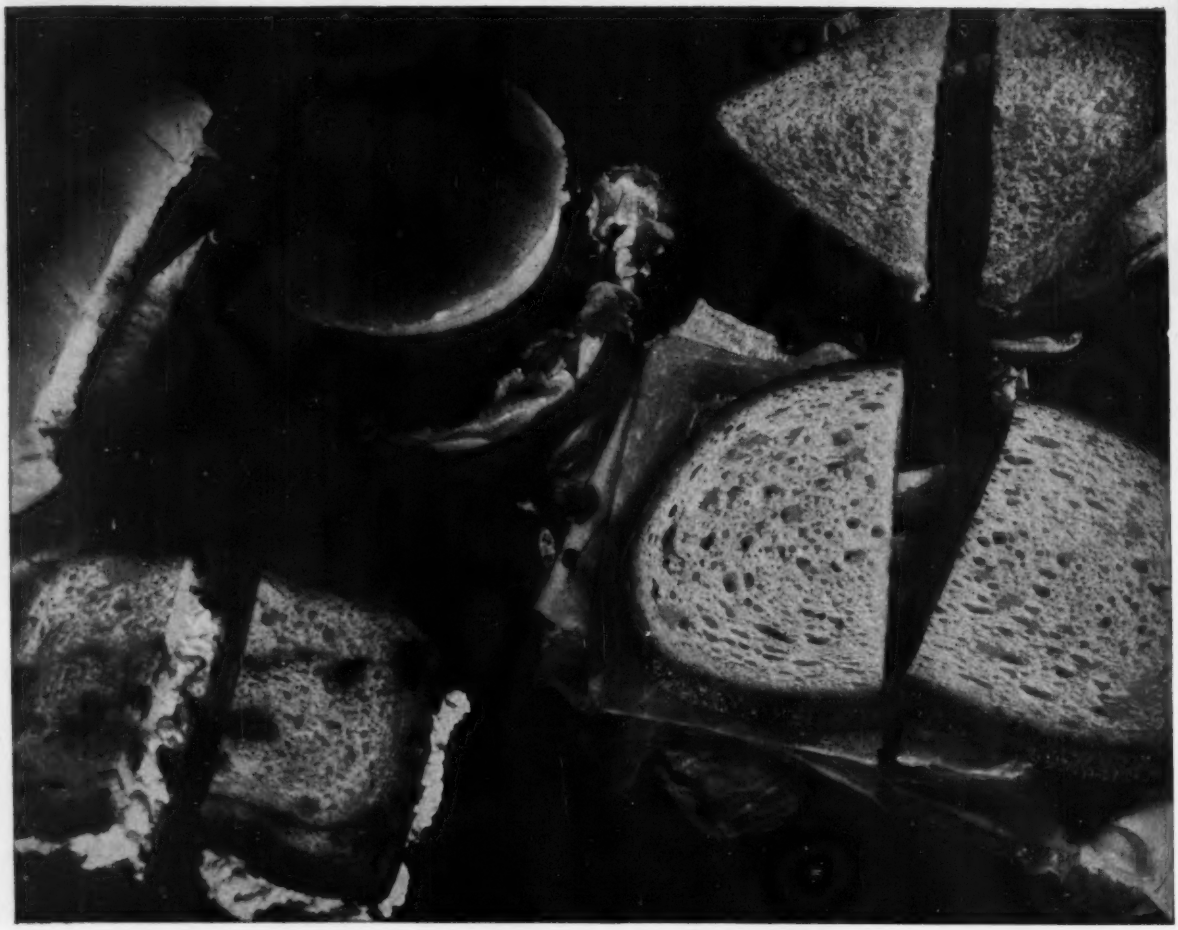

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No Selling Without Buying

A CARTOON BOOKLET plumping for high tariffs has just been prepared by Du Pont's Dyes & Chemicals Division "to stimulate industry thinking on a problem which threatens a large segment of American business. Copies will be distributed to customers in the textile, paper, leather, and other dye-consuming industries."

Titled "Aren't We the Funny Ones?" the booklet advances the familiar arguments for a protective tariff wall. Its captions read: "During the first thirty years of this century we worked hard and learned how to make more and more with less and less labor. Our standard of living grew by leaps and bounds. . . . In addition we had relatively high tariff protection.

"During the world depression of the early thirties we reduced tariffs to try to improve world trade. Then came World War II. After the war we spent billions of tax dollars building modern plants for former allies and enemies. We taught them how to run these factories and sell their products even in the U. S. We *are* funny. In addition, we reduced tariffs until today they average only 5%. We *really* are funny.

"Foreign wages are only a fraction of ours and living standards are correspondingly lower. Foreign countries with new machines but low wages can undersell us not only in world markets but in this country. Many plants have had to close and people were forced out of their jobs. . . .

"What can we do? . . . Lower our wages and living standards? No! Increase our efficiency? We have reached a point where this is difficult to do. Or fight for our very existence by shouting from the housetop to the American consumer and to our legislators. Your opinion about how funny we are would be of interest to your representatives in Congress."

Are we the funny ones? We accept the booklet's invitation to stimulate our thinking. We are quick to agree, for example, that there are some mighty cogent arguments for tariff protection; it is unlikely that the synthetic organics segment of our industry could have survived the '20s without it. But we wonder if a one-sided, oversimplified argument will win many thoughtful industrialists to this position.

One-sided, we believe, because there is no hint that our failure to build up European industry might well have abandoned the continent to communism. Oversimplified, we believe, because there is no hint that our industry—despite the build-up of modern facilities abroad—has been able to double its exports between 1950 and 1959. Nor is there any hint of the safeguards—the peril-point provision and the escape clause, among others—built into our tariff law by the Congress.

Some segments of the chemical industry may suffer so that the industry as a whole may thrive; for it is impossible to sell in world markets unless one buys in world markets. The problem Congress and the President must cope with is how to achieve the greatest good for the many with the least harm to the few.

The chemical industry, having abandoned the relatively cozy confines of the domestic economy, is now eager for world markets. But it hasn't quite figured out what it wants—except that it wants to sell to foreigners but doesn't want foreigners to sell here. It can't have it both ways; and until it resolves its schizophrenia and evolves a consistent and reasonable policy, it will make no impact at all on Congress and the Administration. A sound tariff policy is needed, but it is not likely to be attained by repeating the old shibboleths of either faction.

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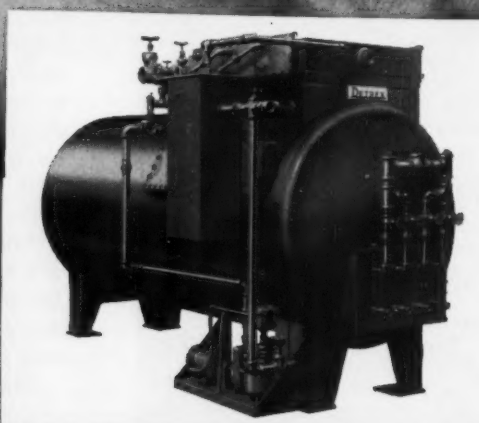

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Safety for Youngsters

TO THE EDITOR: I was very much interested in the article "Chemistry Kits: No Kid Stuff" (*Dec. 17, '60, p. 31*) and another article in *CW* (*Sept. 3, '55, p. 59*).

Besides the three companies you listed, I know that there are a number of smaller companies selling chemicals and rocket fuel to amateur scientists. . . . Many of these companies sell dangerous chemicals and do not appear to be too concerned with the safety of the young amateur scientists. They absolve themselves of any liability by requiring the signature of the parent or guardian on the order blank submitted by a minor. (Obviously kids will forge the signatures.)

One company in particular puts out some rather obnoxious literature in trying to interest the amateur scientists in pyrotechnics. I do not need to tell you that the making of pyrotechnic mixtures (fireworks), which often involves mixtures containing both potassium chlorate and sulfur, is not safe for teenagers.

Is there any criterion, such as the carrying of liability insurance or anything else, that would distinguish a company that is intelligently concerned with the safety of amateur experimenters from a company that is not?

I am interested in maintaining reasonable safety for the amateur scientist. My ideas are very much like those given by Dr. Craig Burns in his paper "Chemical Accidents Involving Minors," *Journal of Chemical Education*, Vol. 33, pp. 508-511.

EDWARD A. PRILL
385 Warburton Ave.
Hastings-on-Hudson, N. Y.

Trading Stamps

TO THE EDITOR: Your article reporting the limited introduction of trading stamps to chemical industry customers (*Dec. 24, '60, p. 77*) opens important marketing and ethical considerations.

Some concerns might elect to give away trading stamps, others price, and still others less quality or service. Take your pick of a wide and ingenious selection.

Since the stockholder has the preemptive rights to assets after creditors, we see no grounds for questions as to the ownership of trading stamps, any more than discounts, prepayments, etc. They are convertible assets clearly belonging to the owners of the business in one form or another.

C. EDWARD WOLFE
Vice-President and General Manager
Cardox
Chicago

Business and Technology

TO THE EDITOR: I should like to take this opportunity to commend you for the fine job you are doing.

I believe the one feature that makes your magazine stand out among others is the use of technical information as an integral part of the articles concerning the business aspects of the chemical industry. This technical information is something that is often overlooked in some journals (that is, in those that are also concerned with business).

I also find your survey of company organization very useful.

To summarize, your journal helps CPI people to think not only in terms of dollars and cents but also in terms of people and process, the two things that are the basis of the chemical industry.

Your article on phthalic anhydride was the most complete and factual account of the situation I have ever read. Congratulations. I hope to see more of the same.

RUSSELL R. SCHWALJE
1531 Jesup Ave.
Bronx, N.Y.

Sawyer's Synthetic Quartz

TO THE EDITOR: Our company was mentioned in your article titled "Quartz: New Cash Crop" (*Dec. 17, '60, p. 99*), but the impression conveyed hardly does justice to our position, particularly as the capacity of our own quartz-growing plant, which has been operating at increasing volume since early '57, is somewhat in excess of your reported capacity of Western Electric Co.'s new plant with its 20 smaller autoclaves.

Actually, in '58, we fully justified your statement that we "reportedly

Hackney
MILWAUKEE

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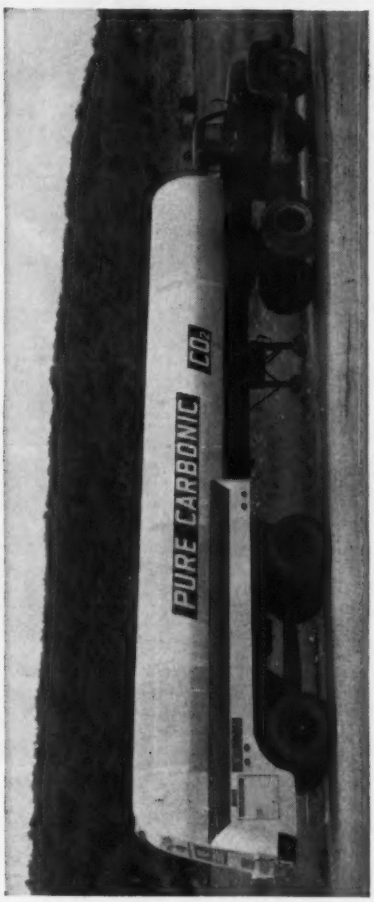

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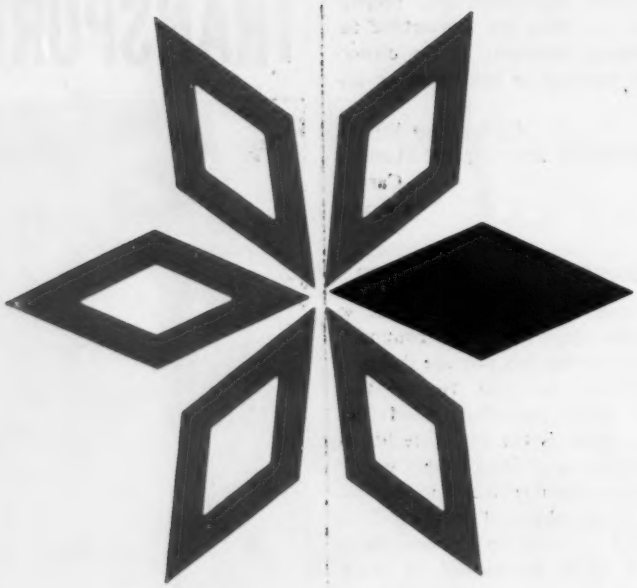

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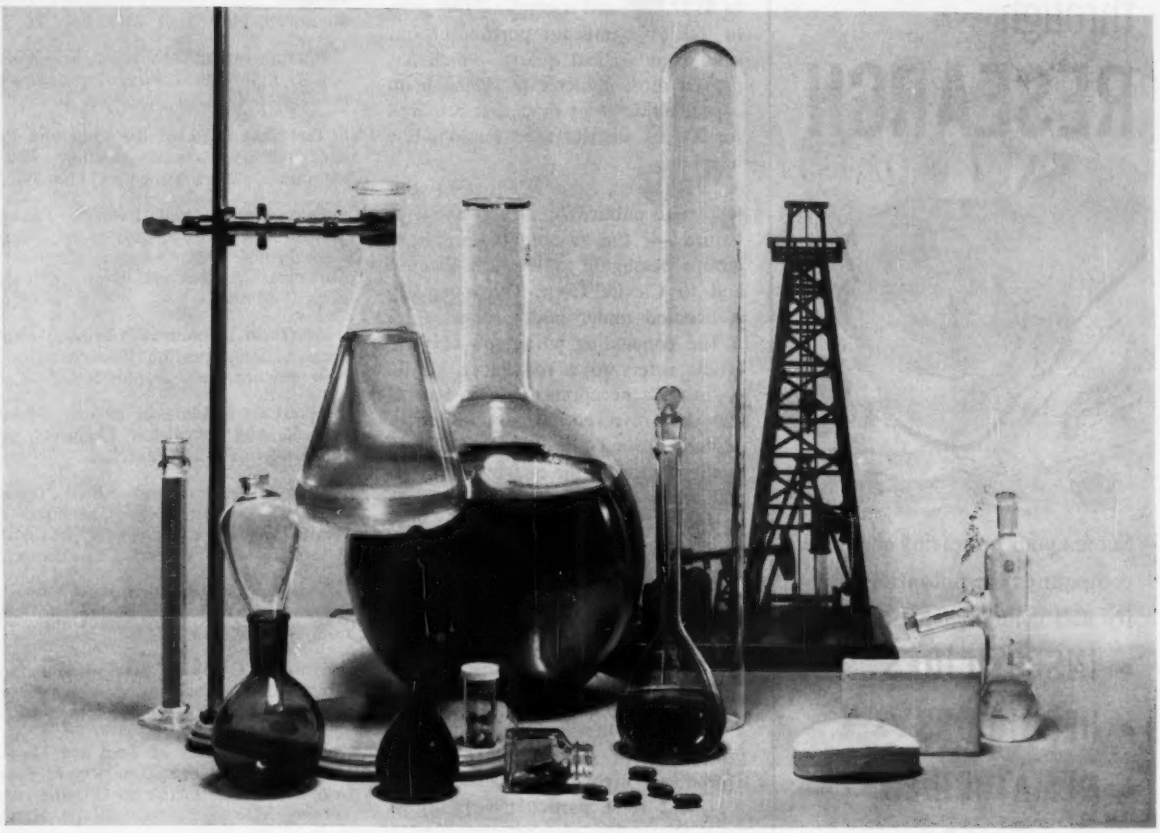

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P. O. Box 2217 Madison 5, Wisconsin

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sold 380 lbs. of quartz crystal." This amount went to the commercial industry. An additional amount went to the U.S. government. The total sale value was $66,000. In '59 our combined sales of quartz amounted to $137,000, and it continued to grow in '60. A significant portion of our sales is in optical quartz, which has proved more difficult to establish on a production basis than that required for X-cuts, such as used for long-line telephony. . . .

. . . The . . . patent situation with respect to cultured quartz is plural in nature — the two most important groups belonging to Western Electric and to Clevite Corp. Our company is licensed under both groups. . . .

The concluding paragraph of your article refers to a remaining hurdle —"product acceptance." This acceptance has revolved, to a considerable degree, around the so-called Q, or quality factor, of the quartz produced, and refers particularly to its application to AT-cuts for oscillators as distinct from so-called X-cuts for filters such as are used in telephony by wire. You and your readers will be interested to know that much progress is being made, particularly through the aid of a current contract from the U.S. Army Signal Supply Agency awarded to this company for the production of grown quartz having a relatively high quality factor.

. . . I refer particularly [also] to your concluding prophetic statement that "it's only a matter of time before synthetic quartz will be available on the open market." This prophecy was actually realized several years ago.

C. B. SAWYER
President
Sawyer Research Products, Inc.
Eastlake, O.

In the last sentence quoted from CW *by Reader Sawyer we should have added, "in sizable quantities."* —ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

MEETINGS

Chemical Market Research Assn., Shoreham Hotel, Washington, D.C., Feb. 15-17.

Synthetic Organic Chemical Manufacturers Assn., luncheon meeting, Hotel Roosevelt, New York City, Feb. 16.

Pharmaceutical Manufacturers Assn., annual midwinter conference, Ambassador Hotel, Los Angeles, Feb. 20-21.

Technical Assn. of the Pulp and Paper Industry, annual meeting, Hotel Commodore, New York City, Feb. 20-23.

Petrochemical and Refining Exposition (first in U.S.), sponsored by American Institute of Chemical Engineers, Municipal Auditorium, New Orleans, Feb. 26-March 1.

American Institute of Chemical Engineers, national meeting, Roosevelt Hotel, New Orleans, Feb. 26-March 1.

American Institute of Mining, Metallurgical, and Petroleum Engineers, St. Louis, Mo., Feb. 26-March 2.

Drug, Chemical and Allied Trades Assn., symposium, "New Challenges in Health, Welfare and Business," Waldorf-Astoria Hotel, New York City, March 2.

National Assn. of Corrosion Engineers, annual conference, Statler Hotel, Buffalo, N.Y., March 13-17.

Synthetic Organic Chemical Manufacturers Assn., luncheon meeting, Hotel Roosevelt, New York City, March 14.

American Society of Tool and Manufacturing Engineers and **Society of Plastics Engineers,** meeting, "Plastics for Tooling Meeting," Statler-Hilton Hotel, Detroit, March 15.

Commercial Chemical Development Assn., Hotel Roosevelt, New York City, March 15-16.

Textile Research Institute, annual meeting, Commodore Hotel, New York City, March 16-17.

Western Metal Congress, 12th meeting, Ambassador Hotel, Los Angeles, March 20-21.

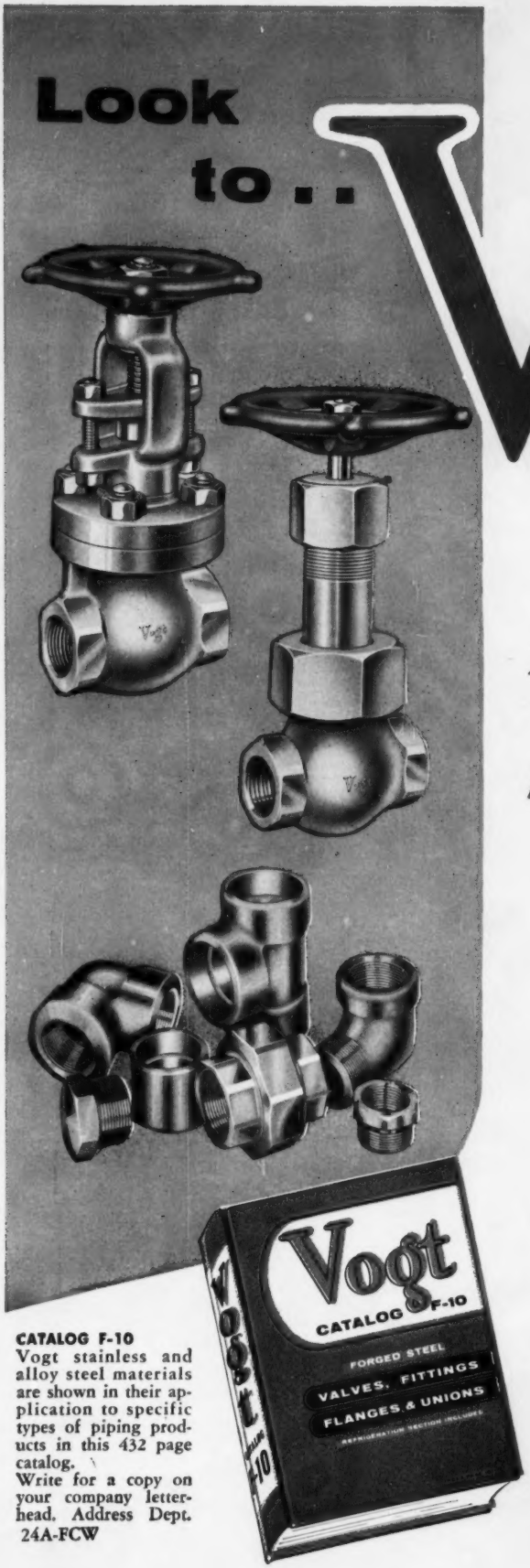
Instrument Society of America, instrument-automation conference, Armory, Washington, D.C., March 20-23.

Nuclear Congress, Chicago, March 20-24.

American Power Conference, 23rd annual meeting, Sherman Hotel, Chicago, March 21-23.

American Chemical Society, national meeting, St. Louis, Mo., March 21-30.

Chemurgic Council, annual conference; topic: "Agriculture's Next 10 Years," Sheraton-Gibson Hotel, Cincinnati, April 12-14.



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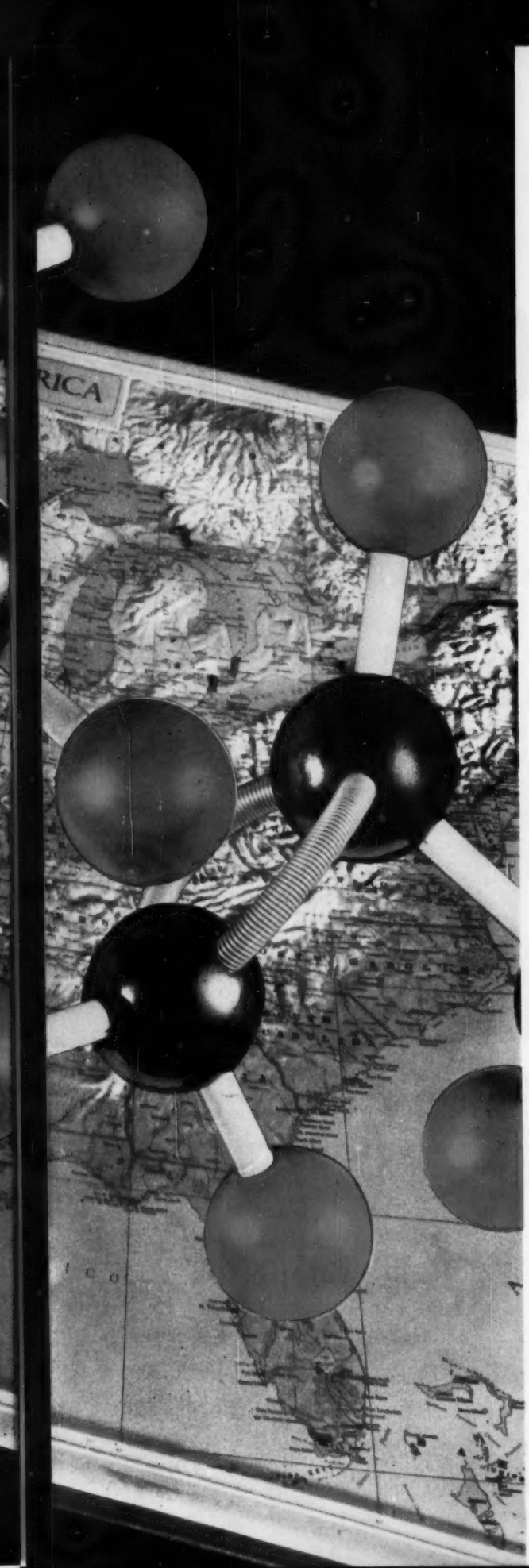
WHAT IS AN OLEFIN?

An olefin is an unsaturated hydrocarbon produced by cracking gaseous or liquid hydrocarbons. The simplest olefin, ethylene —which is highly reactive because of its double bond—combines so readily with other compounds that it is one of the basic building blocks of organic chemistry.

Map © by Aero Service Corp.



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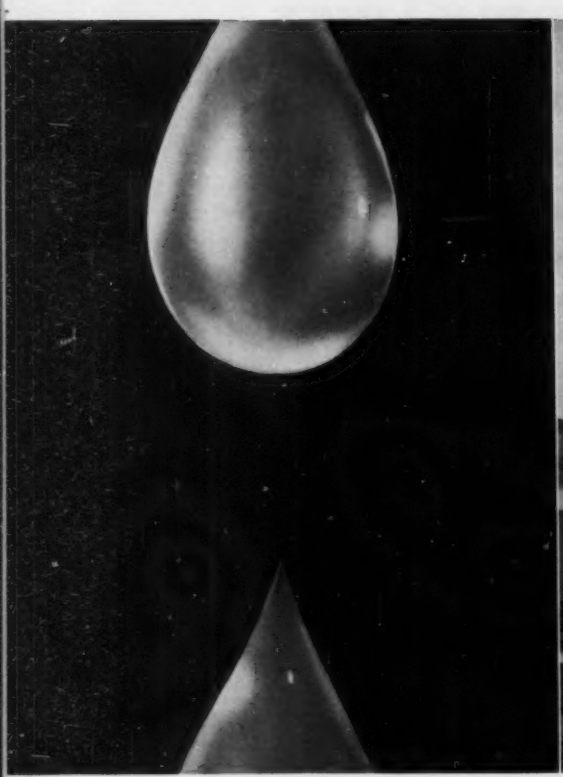

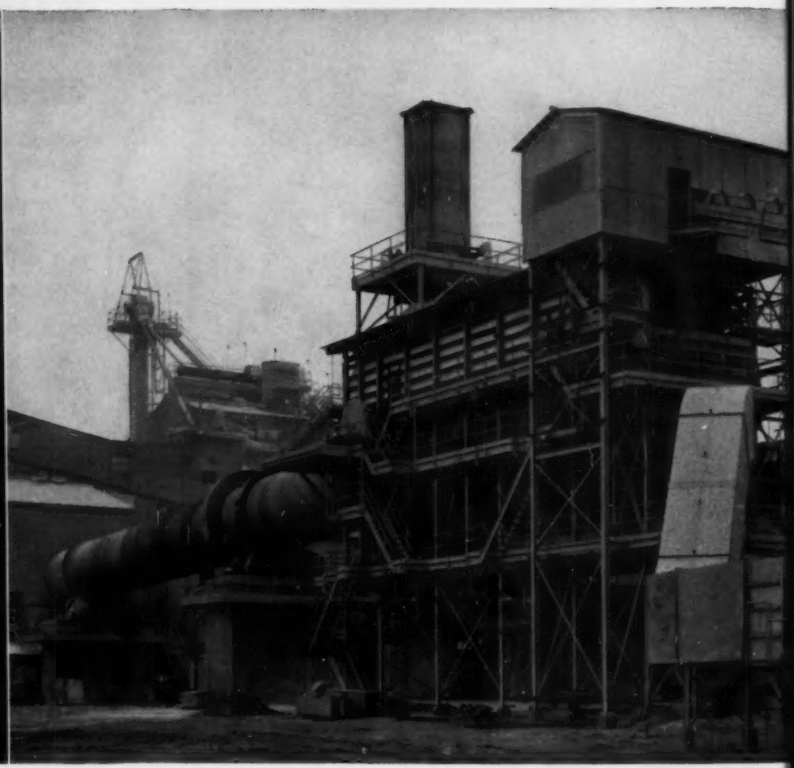

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A control unit that saves space. A pump that pumps practically any solution. These examples demonstrate the extra value that is a standard with A-C... the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industrial Equipment Division, 901 South 70th Street, Milwaukee 1, Wisconsin.

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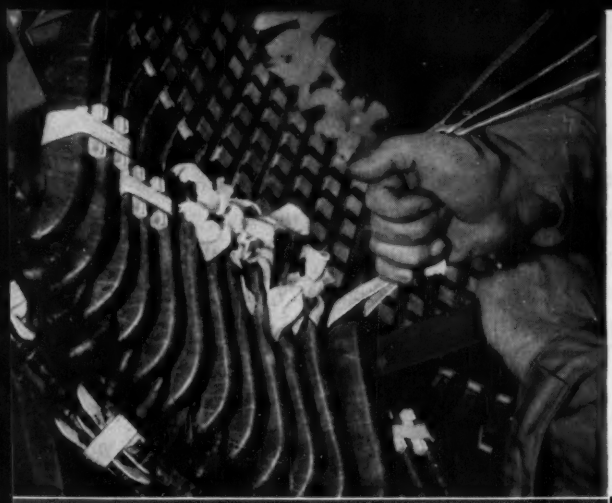
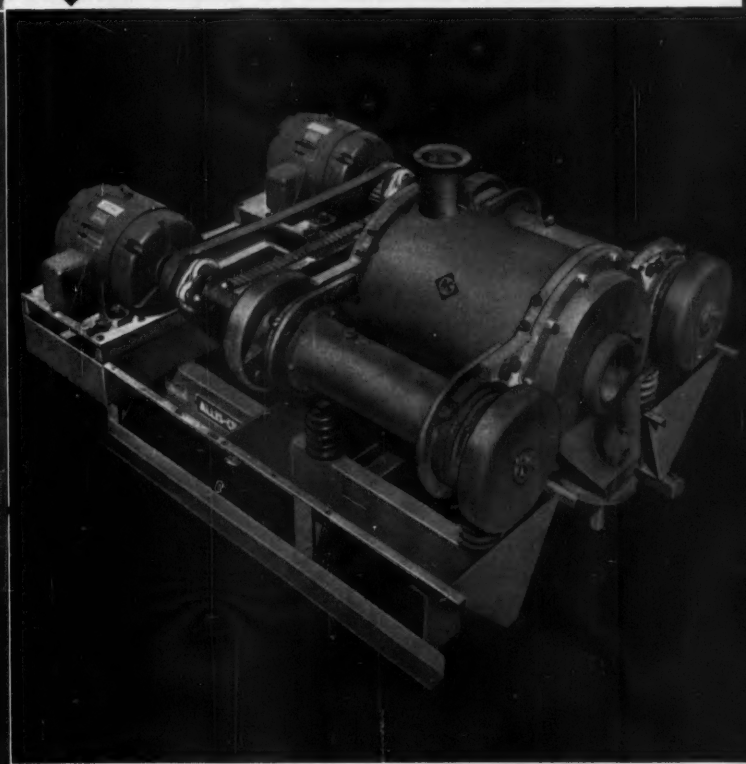


New coil insulation means fast service: Here's downtime insurance you may never need. The Silco-Flex insulation system on large Allis-Chalmers motors is so superior that coil failure is highly unlikely in ordinary service. Should failure occur, the usual 10-day rewind shouldn't be necessary. Usually eight hours is enough for the entire job of replacing the coil.

Compact, 30-inch vibrating mill: Can actually outproduce a conventional tumbling mill 15 to 30 times per unit volume . . . is powered by just two 50-hp motors. Grinding media occupy 80% of mill's 12-cu.-ft. capacity, grind wet or dry materials as fine as two microns, as coarse as 48 mesh. Adaptable to grinding in inert atmosphere, can be utilized for closed or open-circuit grinding.



So low, two fit where one used to go: This new SpaceMaker control center is the first completely new 2- to 5-kv motor controller development in more than a decade. Two-high design can cut floor space needs in half. Full drawout construction makes it the safest, most easily accessible controller available. Flame-retardent, track-resistant Super Pyro-Shield insulation adds reliability. Walk-in Shelter-Clad enclosures available for outdoors.

A-C INDUSTRIAL EQUIPMENT DIVISION: motors, control, rectifiers, pumps, compressors, crushers, grinding mills, screens, kilns, coolers, dryers, Compactor mills, industrial systems.

OTHER A-C PRODUCTS: thermal, hydro and atomic electrical generating equipment, switchgear, transformers, unit substations, tractors, earth-moving equipment, engines, lift trucks.

ALLIS-CHALMERS

Remember when you drained them every night

Cold weather used to bring the bothersome task of draining the radiator every night to keep the water from freezing. Even then, you usually covered the hood with a horse blanket when you stopped the engine during the day. ¶ Now there's a better way . . . Ethylene Glycol Antifreeze, first used about 1927 and now accounting for 90% of the antifreeze market. Jefferson is one of the three largest producers of ethylene glycol and a substantial supplier of packaged antifreeze to Private Label Marketers. To help our customers meet any competitive challenge, Jefferson offers two antifreezes . . . an excellent Conventional Ethylene Glycol Antifreeze and an Extended-Life Antifreeze for a full year's use, plus technical assistance to help meet your unusual requirements. ¶ For complete information on antifreeze products, or the some 50 other petrochemicals Jefferson produces . . . contact Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

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JEFFERSON CHEMICALS

Business
Newsletter

CHEMICAL WEEK
February 11, 1961

Getting ready this week for growing plastics markets:

• Dow Chemical will add a second polyolefin unit to its plant at Plaquemine, La., which started up just two months ago. The new unit will cost $6 million, is expected to be onstream the second quarter of '62. The plant will produce medium- and high-density polyethylene, ethylene copolymers, and polypropylene using a Dow-developed variation of the Ziegler process. Another Dow polypropylene plant—at Torrance, Calif. —will go onstream about the end of March.

• Allied Chemical's new 20-million-lbs./year melamine crystal plant will be built at South Point, O.—where Allied is already producing urea. This will be the first commercial melamine-from-urea facility; others start from dicyandiamide (*CW, Jan. 21, p. 22*).

• Monsanto will increase by 30% the capacity of its high-pressure polyethylene plant at Texas City, Tex. The plant is now estimated to have a capacity of 100 million lbs./year. The expansion is to be completed early in '62.

• The Borden Co. has bid to buy Columbus Coated Fabrics Corp. (Columbus, O.), said to be the largest independent coater of fabrics. The company grosses about $35 million/year, does about 20% of its business in automotive fabrics. The acquisition could—if Columbus's board approves the move—provide a captive outlet for much of Borden's current 80 million lbs./year of polyvinyl chloride, as well as possible expansions based on the 150 million lbs./year of monomer to be produced by Monochem, a Borden-U.S. Rubber joint subsidiary.

• Expanding in raw materials for plastics, Canada's Dominion Tar & Chemical will build a $3.5-million phthalic anhydride plant next to its existing plant at Toronto. It will be in operation by the end of '61, will bring Dominion's phthalic capacity to 35 million lbs./year. Naphthalene from the company's own tar-distillation plants will be the starting material; the oxidation units will be of fluid-bed catalyst design.

•

Rumors of irregularities in the construction of Socony Mobil's new ethylene plant at Beaumont, Tex., have come into the open with the filing of a suit by the company against George Debney, until last November head of maintenance and operations at Socony's Beaumont refinery. The suit—filed in federal district court at Beaumont—asks appointment of a master to hold hearings on claims for damages over $10,000. Mobil charges that Debney received payola from contractors, including the use of men, materials and equipment for home projects, and $17,500 in the form of wages for his son. Says Debney: "I have nothing to say, but I don't feel that I am guilty." Socony says three other employees were fired at the same time, will not comment on further legal action.

Bucking the downturn in drugs: Richardson Merrell (formerly Vick Chemical) and Plough, Inc.

In the July-through-December half of its fiscal year, Richardson-Merrell boosted sales 14.7%, to $78.9 million, and elevated earnings 21.1%, to $10.2 million. President Smith Richardson, jr., says the company's four-way diversification—ethical, proprietary and veterinary drugs plus chemicals and plastics—has proved to be a major factor in continuing growth, "even when economic conditions were not the best."

Plough's 12-month sales were up some 35%, to $46 million, and earnings rose about 14%, to "in the area of $2.40/share." And last week in New York, President Abe Plough again stressed his determination to diversify into ethical drugs.

"We just missed Stuart" (*CW, Feb. 4, p. 22*), he remarked, "but we're talking to others." He posted next Jan. 1 as the deadline for acquisition of an ethical-drug company, stating that Plough would go into the business on its own if a purchase can't be made by that date. "We've been building a pharmaceutical staff for three years, have two ethical products ready for production, and we feel we're ready," Plough says.

•

Allied Chemical Canada will move into Sarnia, Ont.—a major Canadian petrochemical center. Allied has disclosed it will exercise its option on 180 acres on the St. Clair River, five miles south of Sarnia. Although Allied Canada declines to comment on what use it will make of the land, industry observers see this to be the base for a move into petrochemicals. It's conceivable that Allied plans for the site may depend on outcome of Canadian chemical tariff hearings—now in their sixth month.

At the same time, Polymer Corp. will expand out of Sarnia and will build a $12-million specialty rubber plant near Strasbourg, France. The prosperous, Canadian-government-owned rubber producer will enter into partnership with a French banking house, Banque de Paris et des Pay-Bas, to form Polymer Corp. (SAF). Reason for the move: "to meet industrial needs within the Common Market and free capacity (for increased SBR output) at Sarnia."

•

Rayon tire-cord makers are gasping for profit. That's the simplest interpretation of the 2¢/lb. price rise initiated this week by American Enka, which has been operating in the red in recent months. Says an American Enka spokesman: "We haven't been able to make enough money at the price we've been selling it." Enka's new prices—which are being studied by other rayon producers—are significantly closer to the price of nylon. It may result in nudging nylon a step closer toward winning the "original equipment" business in tires for new autos, a market now held by rayon.

Why do compounders of dish and laundry detergents favor Blockson Tripoly?

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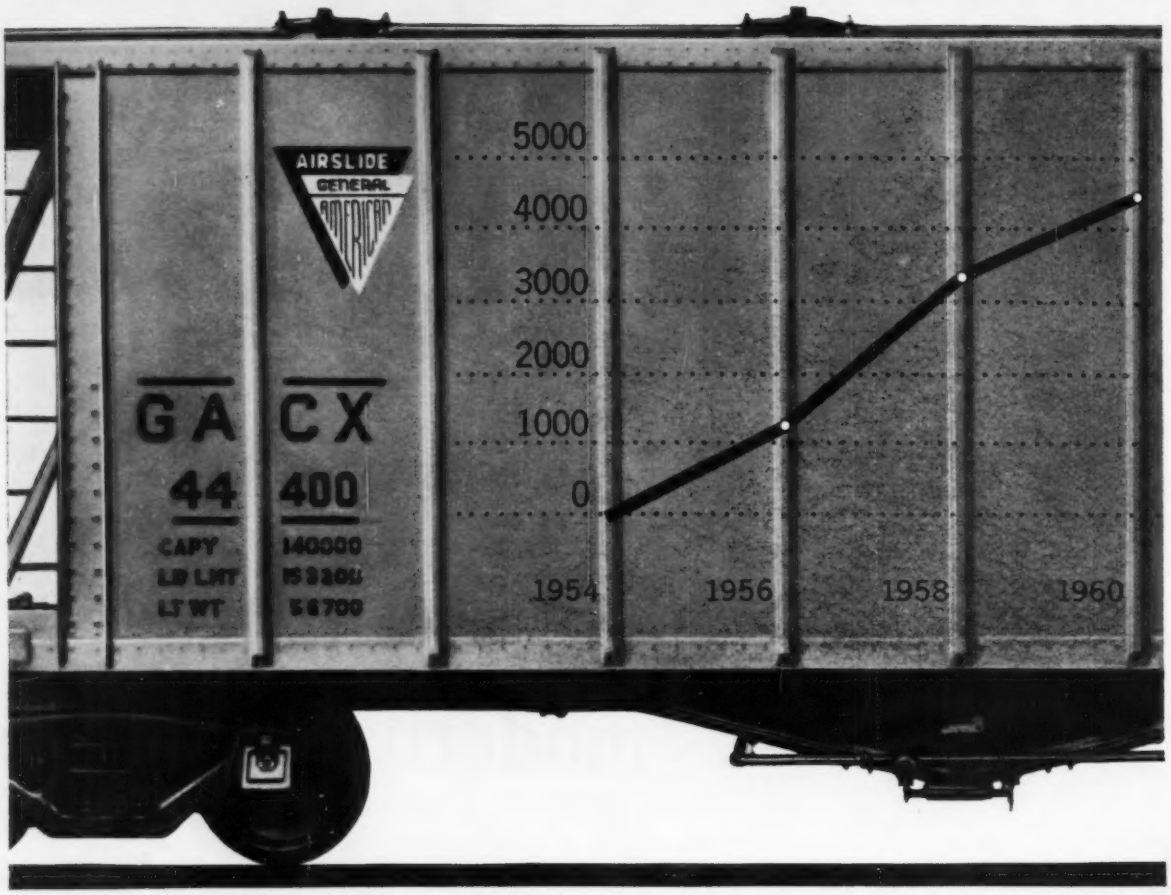

918 BUILT AND DELIVERED IN 1960 Demand for these highly efficient cars is big . . . and steadily growing. Introduced only 6 years ago, the AIRSLIDE car's reputation for safe, bulk shipment and speedy unloading has now made this car the standard for granulated and powdered materials. It is especially desirable for those materials which tend to bridge or pack or which do not normally flow by gravity.

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THE '60 PATTERN: PROFITS TOOK A TUMBLE

CHEMICAL COMPANIES:	SALES Total for '60*	SALES Change from '59	EARNINGS Total for '60*	EARNINGS Change from '59	PROFIT RATIOS '59	PROFIT RATIOS '60
Air Reduction	$ 202.5	Up 0.9%	$ 14.7	Down 1.1%	7.4%	7.3%
Allied Chemical	765.8	Up 6.4%	51.3	Up 2.5%	7.0%	6.7%
Atlas Powder	70.9	Up 0.2%	3.0	Down 23.5%	5.5%	4.2%
Canadian Industries Ltd.	170.7	Up 12.1%	6.6	Up 5.3%	4.1%	3.8%
Catalin Corp.	19.3	Down 13.1%	0.04	Down 46.2%	0.4%	0.2%
Diamond Alkali	138.3	Up 0.3%	11.7	Up 3.6%	8.2%	8.5%
Dow Chemical(1)	796.5	Up 5.2%	70.5	Down 11.8%	10.6%	8.9%
Du Pont of Canada	99.8	Up 9.8%	6.8	Down 4.7%	7.9%	6.8%
Freeport Sulphur	53.0	Down 0.4%	13.2	Down 8.9%	27.2%	24.9%
Harshaw Chemical(2)	72.8	Up 1.1%	1.6	Down 18.0%	2.7%	2.2%
Hercules Powder(3)	336.9	—	27.2	—	8.0%	7.8%
Heyden Newport Chemical	60.8	Up 8.7%	3.65	Up 36.6%	4.2%	5.3%
Hooker Chemical(4)	149.8	Up 0.0%	12.7	Down 5.3%	8.9%	8.5%
Koppers Co.	302.5	Up 25.2%	7.5	Up 28.2%	2.4%	2.5%
Monsanto Chemical(5)	890.5	Up 1.8%	67.7	Down 9.4%	8.5%	7.6%
Nat'l. Distillers and Chem.	580.2	Up 0.3%	21.4	Down 18.7%	4.6%	3.7%
Nopco Chemical	39.9	Up 7.0%	1.8	Down 21.6%	6.1%	4.4%
Rohm & Haas	218.2	Up 1.1%	21.3	Down 8.1%	10.7%	9.8%
Stauffer Chemical	219.8	Down 3.6%	19.8	Down 10.8%	9.7%	9.0%
Union Carbide	1,548.2	Up 1.1%	158.0	Down 8.0%	11.2%	10.2%
PHARMACEUTICAL COMPANIES:						
Carter Products(6)	42.1	Down 5.0%	5.8	Down 20.4%	16.5%	13.8%
Lilly, Eli	178.5	Down 4.5%	18.8	Down 20.0%	12.5%	10.5%
Norwich Pharmacal	45.2	Up 11.1%	6.0	Up 15.6%	12.7%	13.2%
Searle, G. D.	36.9	Up 6.9%	7.5	Up 2.2%	21.1%	20.2%
Smith Kline & French	144.5	Up 7.1%	24.0	Down 3.9%	18.5%	16.6%

* In millions of dollars. (1) Computed for 12 months ended Nov. 30 instead of for company's fiscal year. (2) Computed for 12 months ended Dec. 31 instead of for company's fiscal year. (3) Data not comparable because '60 sales and earnings include operations of Imperial Color Chemical & Paper, acquired by Hercules last April 1. (4) For fiscal year ended Nov. 30. (5) Data for both '59 and '60 include operations of Chemstrand Corp., which last month became a wholly owned subsidiary of Monsanto. (6) For nine months ended Dec. 31.

For CPI Profits, Another Drubbing in '61

Chemical company executives revealing year-end financial data this week share a view of '61's prospects: the same sort of "profitless prosperity" that marked '60 will keep on shaping their companies' operating figures.

They feel that for most chemical companies, first- and second-quarter business will be down from last year's levels. And—aside from special situations involving new products and new markets—they figure that the chemical industry's second-half results will largely depend on whatever happens to the economy as a whole.

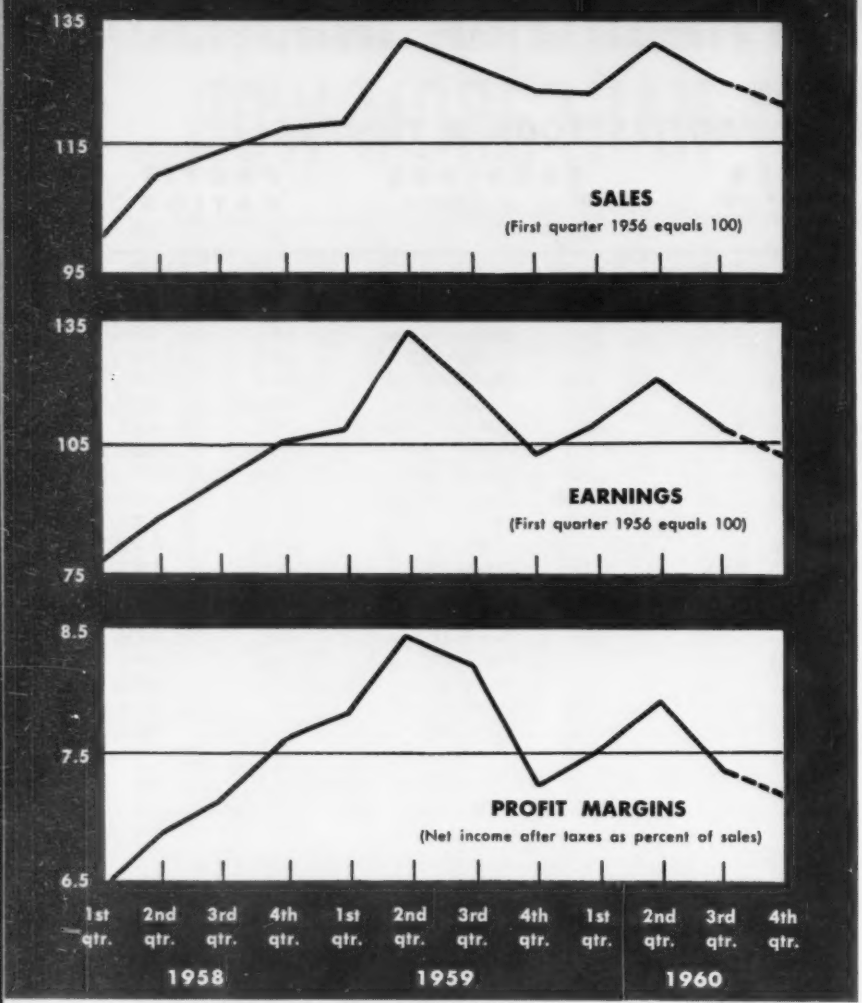
Their views on the '61 business outlook provide a somber accompaniment to '60 annual reports that in most cases are somewhat on the melancholy side — especially when contrasted with last winter's rosy expectations.

From a score of chemical companies — large, medium-size, and small — sales and earnings figures supply the first precise reading on how the current price recession is affecting this industry (*table, above*).

Principal findings:

- Nearly every chemical company has been able to increase sales volume over '59, the previous peak year. For 18 chemical companies for which comparable '59 and '60 data are available, the average rise in sales was 3.7%.
- At the same time, nearly every chemical company lost ground on

CW Index of Chemical Industry Sales and Earnings



earnings. For the same 18 companies, average net income in '60 was down by a disquieting 6.9%.

Costly Price Cuts: This widening spread between sales and earnings—a trend that appears to be running on into '61—indicates that price cuts made during the past year have been moderately successful in extending markets for various "bread-and-butter" chemicals and plastics; but at the heavy cost of diminished profits.

In addition, the general economic downturn was making itself felt in chemical companies' fourth-quarter operations. This lowered both sales and earnings of chemicals and allied products, and dragged the industry's profits-to-sales ration down to its lowest level since the fourth quarter of steel strike marred '59.

Actually, there is considerable optimism about the physical volume of this year's business. Examples: President G. S. Tompkins of American Viscose predicts U.S. cellophane production in '61 will climb by 10 million lbs. to about 540 million lbs.; Firestone's Chairman Harvey S. Firestone, Jr., foresees world consumption of natural and synthetic rubber rising by 165,000 tons this year, compared with last year's increase of 100,000 tons; and President R. S. Stevenson of Allis-Chalmers looks for gross farm income to be at least equal to that of '60 and for actual highway construction to be "substantially greater" this year.

Dow President Leland I. Doan thinks '61 will be a better year than '60 overall, and suggests that when the anticipated upturn comes, chemical industry sales may make a faster pickup than the all-industry average "because of its diversification and its basic position as a supplier to all other major industries."

Rails Lose Barge Bid

Last week U.S. railroads suffered a first-round knockdown in their fight to win Interstate Commerce Commission approval of their plan to expand into new transport fields.

ICC examiner Hyman Blond recommended that the Illinois Central and Southern Pacific railroads be permitted to acquire and operate the John I. Hay Barge Line only if they agree to seven stringent restrictions. Toughest of them: Hay would be allowed to haul only cargoes that have a prior or subsequent rail movement. Observers feel that the roads will reject these terms.

The two roads first proposed the acquisition of the Hay line—a major chemical hauler and one of the nations' 10 largest bargers—in '59, offering $9 million for it. Chemical shippers have been sharply split about the case, some seeing it as a way to rate reductions through joint rates, others fearing to see transport concentrated in rail hands. The decision will likely be appealed.

Soviet Spurs CPI

Russia's chemical process industries stepped up their growth rates last year, according to an official economic report last week; but the Soviet government is not satisfied. The pulp and paper industry, in particular, is being urged to greater efforts to catch up with its counterpart in North America.

In the U.S.S.R., chemical companies' capital investments during '60 were said to be up 33% over '59 outlays. Chemical equipment manufactured during '60 was valued at 224 million new rubles (official exchange rate, $560 million; tourist exchange rate, $224 million)—up 29% from '59 but still short of the target by an unspecified amount.

Production of mineral fertilizers was up 7%, to 13.8 million metric tons. Output of all synthetic fibers increased 18%, to 211,000 metric tons. Cement production rose 17%, to 45.5 million metric tons; and Soviet plants turned out 1,581 million sq.ft. of window glass—a 5% boost over the '59 total.

Over-all industrial production reportedly increased 10% in '60. Steel output was up 9%, to 65.3 million tons.

CW PHOTO—WALTER VECCHIO

Cary's Kugler, Blasius, Marks: Planning to be big when PVC is.

Banking on PVC's Prospects

Cary Chemical Co. (East Brunswick, N.J.)—with a heavy dose of help from Tennessee Gas Transmission Co. (Houston)—plans to become the nation's third-largest producer of polyvinyl chloride. A $13.5-million expansion plan, to be carried out by '65, will increase Cary's capacity to 200 million lbs./year, putting it close behind the industry's leaders, Union Carbide and Goodrich, each with about 250 million lbs./year.

Cary now has a capacity of about 50 million lbs./year at Flemington, N.J. The company's growth program calls for (1) enlargement of New Jersey capacity and (2) a new plant of about 50-million-lbs./year capacity, which will probably be on the Gulf Coast, could be in the Midwest.

Also, Tennessee Gas is reportedly planning to build a large vinyl acetate plant on the Gulf Coast—possibly adjacent to TGT's proposed acetylene plant at Houston, Tex. (*CW, Jan. 14, p. 23*). Details have not been revealed but Cary's (which has an option to buy in) planning chief, Rudolph Kugler, says the plant will utilize a new process that will give it an edge over present methods. The process is now in pilot plant.

Just released earnings figures show that Cary lost about $456,000 in fiscal '60 (ended last September) on $10.76 million sales. Some of that loss is attributable to the currently deteriorating price situation in PVC (price is down from 25¢ to 18½¢/lb.), but most of it resulted from preparations for expansion. During the year, overhead was too high for the size of the business. The company was staffed for a $15-18-million/year volume, but actual sales were much lower. Other overhead items were increased for the bigger business: inventories of PVC, and finished products were increased about four-fold, resulting in a drain on working capital. But transition is progressing and sales are now at an annual basis of $12-13 million.

Still, Cary is committing itself to PVC's future and thinks that in the long run the price decrease will help bring the resin into enough new markets to make it a profitable business at a much higher volume. For example, a lower price should bring PVC strongly into the building industry, which Cary expects to become a major market.

"If the building industry continues to adopt polyvinyl as it has been doing," says Cary president George Blasius, "within 10 years it, alone, could be taking all the output of present U.S. production facilities." Cary believes that within the next five years PVC will be a 1.5-billion-lbs./year plastic.

Cary feels it is in good position to get a healthy share of this market through a long-term contract it has to supply resin to Nixon-Baldwin Chemicals, Inc. (Nixon, N.J.), a major manufacturer of rigid vinyls for the building, packaging and display industries. Blasius helped organize Nixon-Baldwin and is now chairman of the board.

A major share of the money for the expansion will come from TGT, which will get an equity interest (through a $7-million purchase of convertible notes.) but not a controlling share. TGT last week announced an 18% gain in net income, to $61.6 million, on $555 million in operating revenue. Because TGT has received a comparatively small part of its funds through equity financing, and earnings have been good, the company is concerned about keeping per-share earnings at a level that looks satisfactory to the Federal Power Commission. The company is therefore particularly anxious to get as much of its money as it can into areas not subject to federal regulation (*CW, Dec. 24, '60, p. 22*).

At the same time, TGT will use acetylene from its planned 100-million-lbs./year plant to make vinyl chloride monomer, which it will sell to Cary. With Cary planning 200-millions-lbs./year PVC capacity, this means that the TGT monomer plant will probably have a capacity in excess of 200 million lbs./year (the conversion ratio is nearly 1 to 1). Cary has an option to buy an equity.

Cary, through two acquisitions—Regency Plastics, Inc. (Woodside, L.I. N.Y.) and Great Bay Chemicals & Plastics, Inc. (East Brunswick, N.J.)—makes PVC sheeting both PVC and polyethylene film, and is a jobber-converter for PVC and for plastic-coated fabrics. Other Cary properties: Carlew Chemicals, Ltd. (Montreal) producer of vinyl and other plastic compounds) and Chemical Corp. (East Brunswick), heavy in research and a maker of ethyleneimine products and catalysts for making PVC.

Although Cary now ranks about 10th in PVC capacity, Sales Vice-President Raymond Marks figures its marketing strength is about third best in the field. One reason is more diversified marketing. In '58 the company had 80% of its business in wire and cable, but in '60 it was 40% wire

and cable, 30% phonograph records, 20% flooring, 10% other products. Cary is also prepared to expand overseas, is now discussing licensing arrangements with companies in South America and Asia.

Like other areas of the chemical industry that are now beset with overcapacity, PVC is still growing without letup. Cary and TGT—banking on Cary's integration down to the end-product and on TGT's raw material and capital—clearly feel that the PVC market growth will be ample for anyone who lays the right groundwork. The project is currently being fought out in the California Public Utilities Commission and at FPC.

Holding Gas at Home

Recent changes in U.S. policy on natural gas may make the home markets in Texas, Louisiana and other states increasingly attractive to gas producers and create a buyers' market for CPI plants in those gas-producing areas.

Whether more gas will become available—at lower prices—for petrochemicals and other industries within producing states remains to be seen. But there are two new developments that could lead to that:

(1) The U.S. Supreme Court has upheld the Federal Power Commission's broad authority to block interstate sales of gas for industrial use—a type of sale that had become increasingly popular because FPC has no authority to regulate prices involved.

(2) Congress is almost certain to make a thorough, two-year study of national fuel resources, possibly leading to a national fuels policy and even tighter curbs on gas uses considered wasteful of a superior fuel that is being used up.

The court's decision, involving Transcontinental Gas Pipe Line Corp, upheld the FPC view that Consolidated Edison (New York) should not be allowed to buy gas produced in Texas and transported by Transco.

Some indication of how FPC will use this power may come soon. That will be when the commission rules on the biggest pipeline project now being planned in the industry, Tennessee Gas Transmission Co.'s $225-million proposal to link south Texas and Los Angeles with a natural gas pipe line running through Mexico.

Merging for Might

Mergers and expansions in the British chemical industry this week appear to be part of plans to invade European and world chemical markets more forcefully than ever.

Principal reason for most of the proposed mergers: consolidation to meet competition from foreign companies. As one industry executive told CHEMICAL WEEK, there's a need for "bigger units to face freer and more competitive international trade" — and chemicals are now Britain's third-largest export business.

Other reasons: growing competition at home, need for diversification, and the increasing cost of research. Another factor that may be behind the current wave of mergers is the possible introduction of a capital gains tax in the new budget to be presented eight weeks from now. Such a tax would make share-exchange mergers much more expensive, and many companies are trying to complete mergers as soon as possible.

Current corporate growth moves:

- Distillers Co. Ltd. has made a $35.6-million share-exchange offer for British Xylonite Co. Ltd., one of the largest British plastics fabricators. Distillers has had 50% interest in a Xylonite subsidiary since '39.
- Laporte Industries Ltd. has made a $9.1-million share-exchange and cash offer for the stock of Howards & Sons Ltd. Both are chemical producers. The offer valued Howards' common stock at more than five times its '60 low—an indication of the stiff price that pharmaceutical and chemical firms are currently commanding on the take-over market.
- Turner & Newall Ltd. has made a $53.2-million cash and share-exchange bid for British Industrial Plastics (*CW, Feb. 4, p. 25*).
- Universal Asbestos Mfg. Co. and Thermo-Plastics Ltd. are founding a 50-50 joint subsidiary to produce plastic ma.erials for the building industry.
- And Imperial Chemical Industries is starting an $11.2-million expansion program to improve research, production and distribution facilities of its pharmaceutical division.

Albright & Wilson Ltd. has made a $23.8-million share-exchange and cash offer for W. J. Bush and Co. Ltd. Both are highly diversified chemical producers with complementary lines.

Distillers' Bierwirth: Common interests are good reasons for combining.

Metals Make a Merger

In a move to bolster their efforts in the refractory metals field, directors of National Distillers and Chemical (New York) and Bridgeport Brass (Bridgeport, Conn.) this week approved a proposal to merge the two companies.

NDC Chairman John Bierwirth and Bridgeport President Austin Zender indicated a primary reason for the merger is to combine the two companies' financial resources and their research, production and sales skills in metals and fabricated metal products. The two concerns have already been working together through Reactive Metals Inc., a large producer of zirconium, titanium, hafnium, tantalum and columbium. National owns 60% of Reactive, which Bridgeport manages for a fee. Bridgeport reportedly has been doing development work in refractory metals for some time. Also, the two companies plan to combine their growing interests in developing foreign markets.

If stockholders approve the merger at annual meetings in May, the metals company would be merged into National, with National exchanging 1.35 shares of its common stock for each share of Bridgeport. This would result in a company with combined annual sales of about $730 million and assets of about $625 million. Bridgeport would become a division of National; no change in management of Bridgeport is anticipated. The merger would raise National's outstanding common shares from 10.4 million to 12.5 million.

national roundup

Rounding out the week's domestic news.

Companies

Michigan Chemical Corp. (Saint Louis, Mich.), producer of rare-earth metals and oxides, and Dresser Products (Great Barrington, Mass.), metal and cermet fabricator, have agreed to supply jointly finished rare-earth products to the nuclear, metallurgical and electronics industries.

Industrial Biochemicals (Edison, N.J.) has started production of specialty biochemical products for industrial use and will also offer consulting services to the same field. The company's pilot plant and production facilities will also be used for manufacture of fermentation chemicals. Officials, now negotiating contracts for products, say they will not make biochemical enzymes at the new facility.

Lehigh Chemical Co. (Chestertown, Md.), producer of specialty diester lubricants, is branching out into the production of polymeric plasticizers. The move is part of the company's broadening sales program aimed at the aviation and automotive industries. Present production facilities will be used to turn out plasticizers as well as the company's lubricant products.

C. F. Kirk Laboratories (New York) has purchased Moore & Co. (Worcester, Mass.), ethical pharmaceutical manufacturer. Moore becomes a subsidiary of Kirk but will maintain its separate identity and operate under its present management. Kirk plans to develop and market new specialty products and boost sales promotion and advertising programs for Moore products.

American-Marietta Co. (Chicago) has purchased Manley Sand Co. (Rockton, Ill.) and an affiliate, Portage-Manley Sand Co. Price: $4.8 million. Both acquisitions will operate as Manley Sand Co. division of American-Marietta. The Manley companies supply silica sands to chemical, glass and foundry industries.

Expansion

Sulfuric Acid: Consolidated Mining & Smelting Co. (Montreal), will convert impure sulfur dioxide from its new, $7.5-million pig iron smelter at Kimberley, B.C., into sulfuric acid. The acid will go into production of the company's inorganic fertilizers, a major Cominco line. Coke for the smelting operations will come from nearby suppliers, but there will be no coal chemical by-products from the new plant.

Benzene: Contracts have been awarded for two large benezene-from-petroleum units (*CW Business Newsletter, Sept. 17, '60*): Canadian Bechtel Ltd. will build a $5-million, 30-million-gal./year plant for Imperial Oil Ltd. at Sarnia, Ont. Work will begin this spring with completion expected in the fall. Procon, Inc., has received a $2.5-million contract to install a Udex unit at Plymouth Oil's Texas City refinery. A second contract, for installation of a Hydeal unit for conversion of toluene from the Udex into benzene, will be awarded in the near future.

Phosphate: International Minerals & Chemical Corp. will begin a $5-million improvement program at its Achan and Noralyn phosphate plants. Expected completion of the project: early '62.

Manganese: Work has started on American Potash & Chemical's $5-million electrolytic manganese plant at Aberdeen, Miss. The new plant, scheduled onstream by November, will have an initial capacity of 10-million lbs./year.

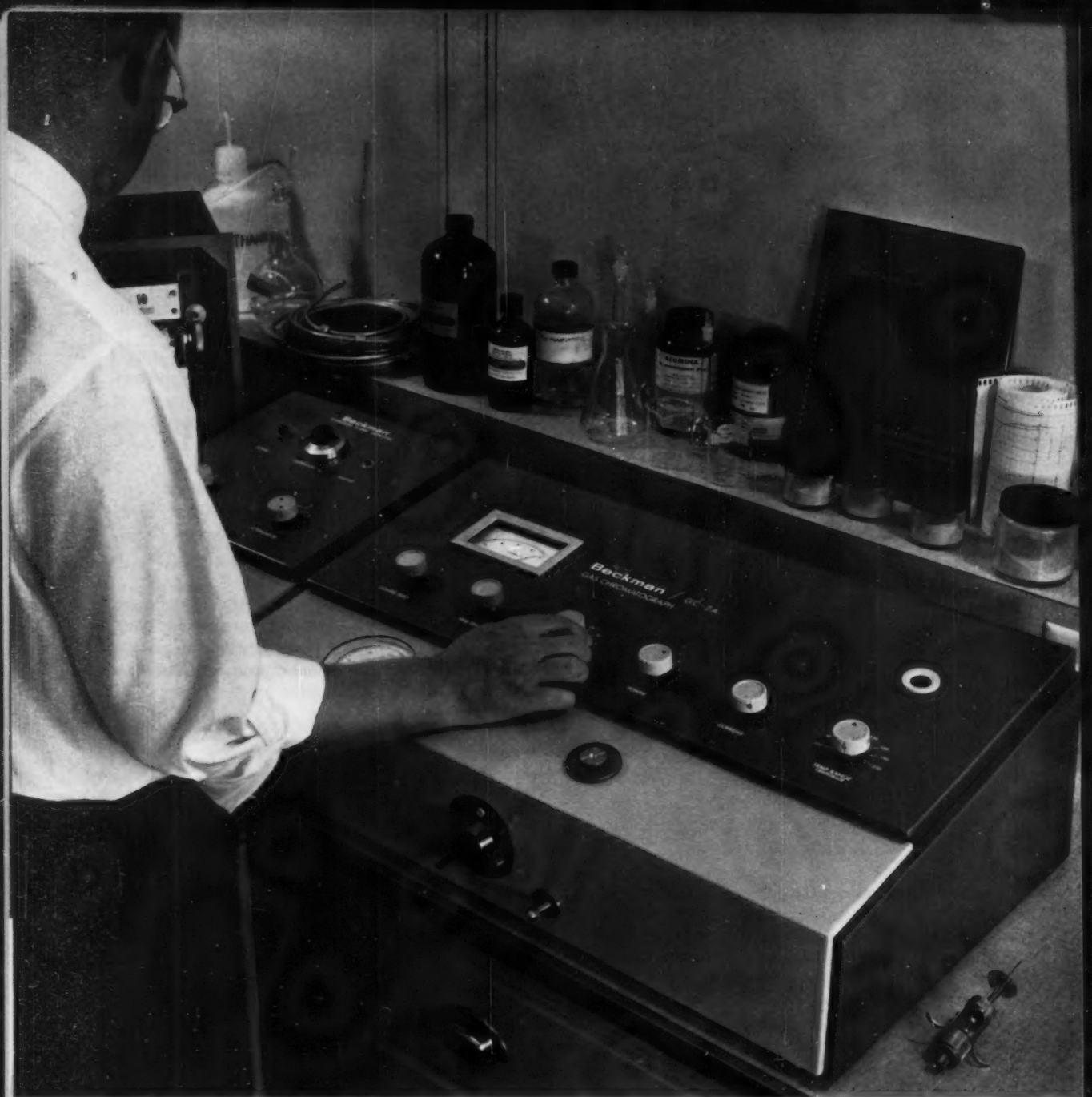
foreign roundup

Rounding out the week's international news.

Fertilizers/Mexico: Petroleos Mexicanos (PEMEX) —government-owned oil and gas agency—is taking another step into the chemical industry with plans to build a $2.5-million fertilizer plant on the Isthmus of Tehuantepec near its Minatitlan refinery. The plant will be operated by a new company, Fertlizantes del Istmos, S.A., and will produce urea, ammonium nitrate, ammonium sulfate, ammonium phosphate, nitrosulfates, nitrophosphates, superphosphates, sulfuric acid and phosphoric acid.

Drugs/Lebanon: A joint-stock company, capitalized at $1.5 million, is being set up by a group of Lebanese pharmaceutical importers to produce a complete line of drugs. The group is arranging for licensing and technical assistance from European drug manufacturers.

Carbon Black/Venezuela: United Carbon Co. (Houston, Tex.) will build a $3-million carbon black plant in the Valencia area of Venezuela. The plant, scheduled for operation by late '61, will have an initial capacity of 20 million lbs./year. The six types of furnace blacks to be produced will be used by the tire and rubber industries of Venezuela, Columbia and other nearby countries.



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Washington
Newsletter

CHEMICAL WEEK
February 11, 1961

An inquiry into production of "counterfeit" drugs is proposed by Sen. Estes Kefauver (D., Tenn.) for his Antitrust and Monopoly Subcommittee. He says he has received reports of "The replacement of an efficacious product with something that is completely worthless."

Kefauver insists, in a special report, that the investigation will "determine the extent of the practice, the individuals and enterprises responsible for it, and the best ways and means of bringing about its immediate termination." No time has been set for hearings.

Kefauver also plans hearings to determine how pricing policies may have helped drive American-made goods off foreign markets. He lists 10 basic industries in which—with the marked exception of chemicals—exports fell from 1.6% to 32.9% between '53 and '59 while prices generally were rising.

Chemicals and related products moved against the trend. Exports of these items rose 75.1% between '53 and '59 while prices rose 4%. In the same period exports of petroleum and allied products dropped 32.9% while prices rose 3.4%; exports of coal and related fuels declined 3.1% as prices rose 8.7%.

•

Vigorous action against "administered" pricing policies that may be in violation of antitrust laws can be expected from Paul Rand Dixon, scheduled to become chairman of the Federal Trade Commission. Prices are probably the overriding interest in his professional career.

No stranger to FTC, Dixon was a trial attorney on the agency's staff from '38 to '57, with three years out for war service. In that period he helped to prepare such landmark cases as FTC's attacks on "basing point" pricing systems in steel and cement.

But since '57 he has really come into his own as chief counsel for the Kefauver subcommittee. In that post he has conducted extensive hearings for Kefauver into "administered" prices in such basic industries as steel, autos and roofing materials.

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A new drive for a 27½% tax depletion allowance for shale oil seems doomed to a failure again this year. Colorado business and political leaders stepped up their campaign after the Kennedy Administration indicated it may give more attention to the development of untapped sources of energy.

Colorado members of Congress took the cue and introduced the necessary legislation. But privately they're not too hopeful. All depletion allowances, particularly the 27½% rate for oil and gas, are due for searching analysis by both the Administration and Congress this year. In addition oil shale development will be resisted by industries already in the highly competitive energy market.

Washington Newsletter

(Continued)

Tax benefits to induce investment in new plant and equipment are being firmed by the Kennedy Administration. The President mentioned the subject in his economic message last week, promising details at a later date. But most of the details can be supplied now.

The tipoff comes through Stanley S. Surrey, a Harvard professor, who is slated to be Assistant Secretary of the Treasury for tax policy. His views are widely known through the Kennedy task-force report on tax policy, which he authored (*CW Washington Newsletter, Jan. 21*). He is strongly in favor, for example, of a reduction of the 27½% depletion allowance on oil.

What Surrey also favors—and he will find considerable support in the Administration and Congress—is a tax credit to be deducted from a company's final tax bill, instead of its income, for a percentage of funds invested in new plant and equipment in a given year. It would work like this:

A chemical company, for example, invests $1 million in a new plant and equipment in '62. In figuring its federal income tax on a regular basis, it finds that this investment exceeds its amortization allowances by $200,000. If congress set the new benefit figures at 25% it then would deduct $50,000 from its tax payment.

There seems to be more sentiment in Congress favoring this type of a tax incentive program than any other. It gives the government an iron-clad guarantee that the tax benefit will be granted, after the fact, only for money spent on new plant and equipment. There is no chance of diverting the money to other uses.

The feeling now is that the Surrey proposal, or something very much like it, will be enacted by Congress before it goes home this year. Other plans are in the works. But the belief is so strong that the Surrey proposal is it, those who usually press for liberalized depreciation and other incentives are lying low. They want to see the form of the Administration bill before mustering their forces in an effort to bend it to suit their particular needs.

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Another drive to let the government sell its shares in General Aniline & Film Corp. is under way in Congress. The measure, similar to one that never came to a vote in the last Congress, is sponsored by the four senators from New York and New Jersey. Under the bill, proceeds from the government sale would be held in trust, pending court disposition of the Interhandel claim to the shares.

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Correction: In the Feb. 4 Washington Newsletter item on chemical process companies ranking high on the military list of prime contractors for fiscal '60, the amount of awards should have read in terms of thousands of dollars, not millions.

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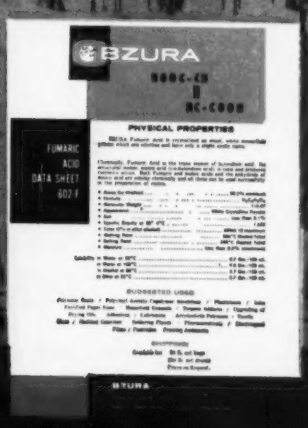

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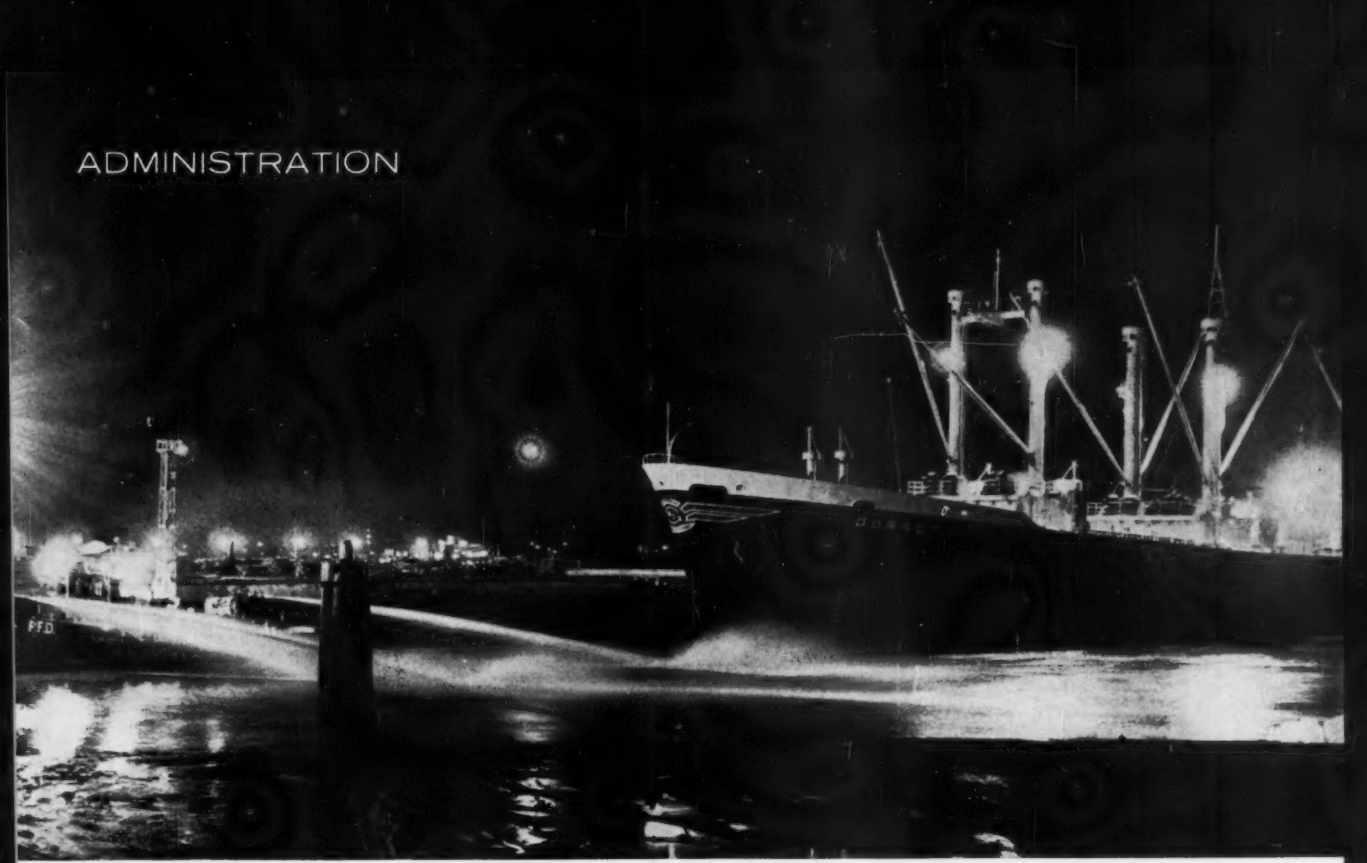

Fireboat hoses break up orthoxylene slick from pipeline broken in mooring accident.

Now in the Limelight: Waterfront Pollution

Last week a ship nosing into its berth at Philadelphia knifed into a chemical pipeline, spilled 15,000 gal. of ortho-xylene into the Delaware River. A couple of days later another vessel broke a submerged oil line in nearby Schuylkill River, spread flammable oil over the stream. Occurrence of these mishaps drives home the point that process industries must plan how to cope with the unexpected as well as the anticipated pollution problems.

It is a complex job but one in which the agencies responsible for cleaning up waterways are providing a helping hand. But such bodies can do little more than move quickly when there's a mishap, can't do much to relieve a company's burden. The truly fundamental job of spotting, then eliminating, the process steps that might accidentally cause pollution still rests with the company.

And much can be done. The case of Humble Oil (Baton Rouge) provides some encouraging evidence. Last winter Humble Oil spilled phenol into the Mississippi. The phenol became chlorinated during normal water treatment, spoiled the taste of the drinking water supplied to a million people from Baton Rouge to New Orleans. Spurred by this, the Louisiana Stream Control Commission, in cooperation with industries along the river, set up a warning system. The plan was to continuously sample the water so that pollution could be quickly spotted and its source traced.

The plan soon got a tryout on phenol, when Humble again accidentally spilled some into the river. This time the chemical was detected and the spillage was stopped before any complaints developed. But Humble has since got to the heart of the trouble, installed a $500,000 phenol stripping tower to remove the chemical from waste water, thus preventing recurrence of the mishap.

As a similar measure, Tennessee Oil & Gas (New Orleans) and Shell Oil (Norco, La.) have installed phenol disposal wells. And pollution-abatement committees have been set up at practically every refinery along the Mississippi to increase awareness of pollution and its dangers.

On the Mississippi, state agencies must deal with water polluters. Last month a foreign ship pumped its oily bilge into the Mississippi. The Louisiana State Board of Health analyzed the oil, tracked down the responsible ship and is filing suit against its owner in federal court.

Public's Help: The board of health also publishes news releases on pollution accidents, aims to enlist the aid of the public wherever possible. John Trygg, the board's engineering director, says the board, the Louisiana Stream Control Commission, U.S. Corps of Engineers and Coast Guard are all intensifying their efforts to locate the source of spot pollution. He notes that the warning system is working well. In many cases the pollution appears to be caused by carelessness. But he is concerned about "numerous false alarms; they may cause waterworks people to become indifferent."

Legal action is supplanting public apathy in many instances of accidental pollution. Insecticide maker Acock Laboratories (Austin, Tex.) washed its mixing plant, allowing chemicals to flow into a stopped-up storm sewer. When the city of Austin cleaned out the sewer, chemicals were liberated, killing tons of fish in the Colorado River. Acock was fined $100.

Room for Progress: Few other regions have their rivers policed as

closely, or have such industry cooperation, as have the areas on the Mississippi. And even where there is a close watch, there is seldom a way to prepare for every eventuality.

In the Philadelphia cases, for example, those companies involved can do little more than restore things as closely to normal as possible. Allied Chemical's Plastics Division—owner of the *o*-xylene—was not actually "in custody" of it at the time of the accident.

The chemical pipeline's owner, Delaware River Terminals, Inc., points out that the ship crash was a "one in a million" thing, concedes that extra care may be necessary in berthing ships in the future. And both Allied and the pipeline company hope there'll be no repercussions.

Philadelphia's other accident, in which oil spurted from Atlantic Refining's line, exemplifies a sort of pollution that plagues all major harbors. No matter what goes wrong, there's little that can be done to correct it; all concerned can only wait until the oil washes out to sea.

Oil spills are the worst and most frequent accidents. About 15-20 oil spills—ranging from a few barrels to thousands of gallons—occur in the San Francisco Bay each year. The situation in Los Angeles harbor is even worse.

What is done in cases of such pollution? General public reaction is to punish the offenders. In California this job is up to the Fish and Game Commission.

Key to its prosecution is an ordinance prohibiting the discharge of materials harmful to fish. (One pending case involves Johns-Manville.) Violation of the ordinance is a criminal action, punishable by a $500 fine. If the state can prove damages, then a civil action with heavy penalties could result. If the state can produce dead fish, estimate how many have been killed and cost of raising them in the hatchery, how much sportsmen spend to catch game fish, and related items, the result could be a whopping figure for damages—if the civil case is proved. In most instances, however, damages are hard to prove, particularly if pollution doesn't actually kill fish but makes the water uninhabitable (e.g., by forming slime).

Concerted action helps too. Last month a 16-man Canadian committee started a campaign to unify the water-pollution battle into a nationwide effort. Headed by Montreal engineer A. L. Van Luven, the committee will survey fragmentary antipollution work, collect information on water conservation methods, present its findings to its joint sponsors, The Engineering Institute of Canada and the Canadian Institute of Sewage and Sanitation.

Most chemical process companies intend to keep out of trouble by doing all they can to avoid pollution. Many of them monitor pollution hazards constantly. Esso Standard Oil's Bayway, N.J., refinery, for example, maintains a round-the-clock patrol (*CW, May 10, '58, p. 47*) to spot oily sewers, etc.

As industry grows, so do its pollution worries. But seasoned observers believe that pollution accidents—like any other—don't just "happen." Vigilance, they reason, can keep pollution in check.

Du Pont Answers

Du Pont, in a brief submitted last week to the U.S. Supreme Court, restated its position that it should not be forced to divest itself of 63 million shares of General Motors Corps. stock.

Du Pont's 135-page brief will be the last submitted to the court before the company and the government appear before the court for argument soon after it convenes Feb. 20.

The government is opposing a federal district court decision, which would allow Du Pont to retain title to the GM shares but pass along voting rights on the stock to its own shareholders. The Dept. of Justice insists that Du Pont must divest itself of these shares in compliance with the Clayton Act. The Supreme Court has already found that this act is violated by Du Pont-GM ties.

Du Pont maintains that divestment would result in severe tax losses to its shareholders, as well as market depreciation of both Du Pont and GM stock, which would harm both companies' stockholders. Du Pont asserts in its brief that by passing along voting rights on the GM shares to Du Pont shareholders, the chemical company would be left with a "sterile investment" in GM, which would prevent any possibility of preferential dealing between the two companies.

KEY CHANGES

Howard S. McCray to president, The Texas Pipe Line Co. (Houston).

R. E. Withrow to treasurer, **J. B. Rowell** to comptroller and assistant treasurer, Dow Chemical International Limited S.A. (Midland, Mich.). Withrow succeeds **W. R. Clulo,** named chief financial officer and treasurer of Dow-Unquinesa, Dow affiliate in Bilbao, Spain.

Arnold F. Kaulakis to vice-president and member of the board of directors and executive committee of Esso Research and Engineering Co. (Linden, N.J.).

R. S. Binns to executive vice-president and **D. L. Richards** to vice-president, Carlisle Chemical Works, Inc. (Reading, O.).

L. G. Rodgers to vice-president, Sunray Chemical Co. (Tulsa, Okla.).

D. E. Sullenberger to vice-president, Arkansas Louisiana Chemical Corp. (Shreveport, La.).

James R. Britt to vice-president and general manager, Universal Oxidation Processes, Inc., subsidiary of Universal Oil Products Co. (Des Plaines, Ill.).

Hans Schindler to vice-president, Sonneborn Chemical and Refining Corp. (New York), wholly owned subsidiary of Witco Chemical Co. Inc.

Alfred N. Watson, to vice-president, marketing services, United States Rubber Co. (New York).

Edward Tarnell to president, Roger Williams Technical & Economic Services, Inc. (Princeton, N.J.).

Harry M. Weaver to vice-president for research and development, Schering Corp. (Bloomfield, N.J.).

Gene E. Zinniger to executive vice-president, Ormet Corp. (New York).

Ralph F. Gow to president, Norton Co. (Worcester, Mass.).

A. E. Albright to president and board chairman, Stauffer-Hewitt, Inc. (Franklin, N.J.), new polyurethane foam producer formed by Stauffer Chemical Co. and Hewitt-Robins, Inc.

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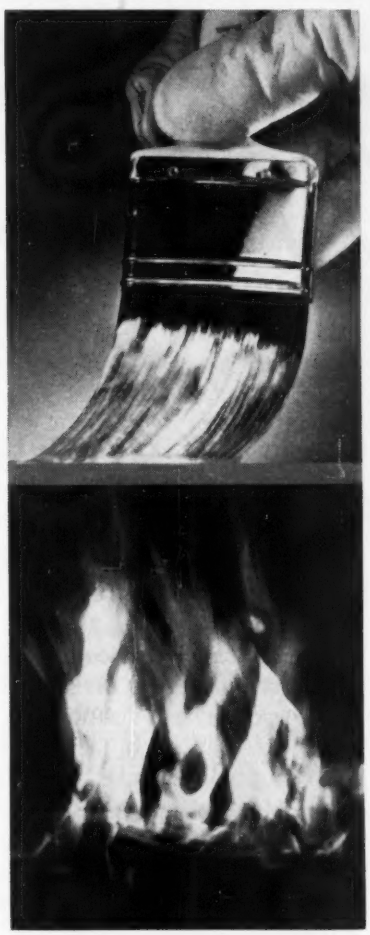

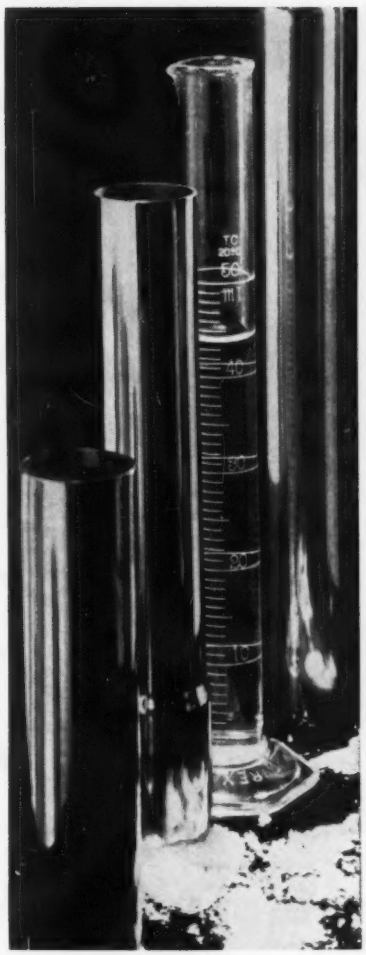

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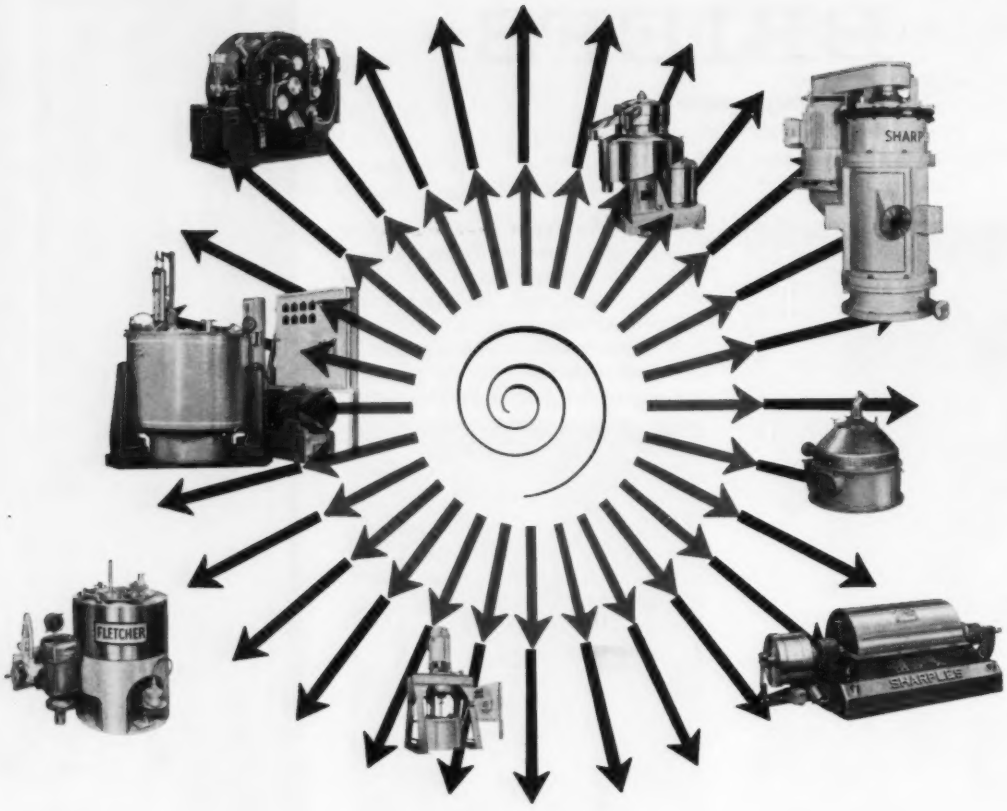

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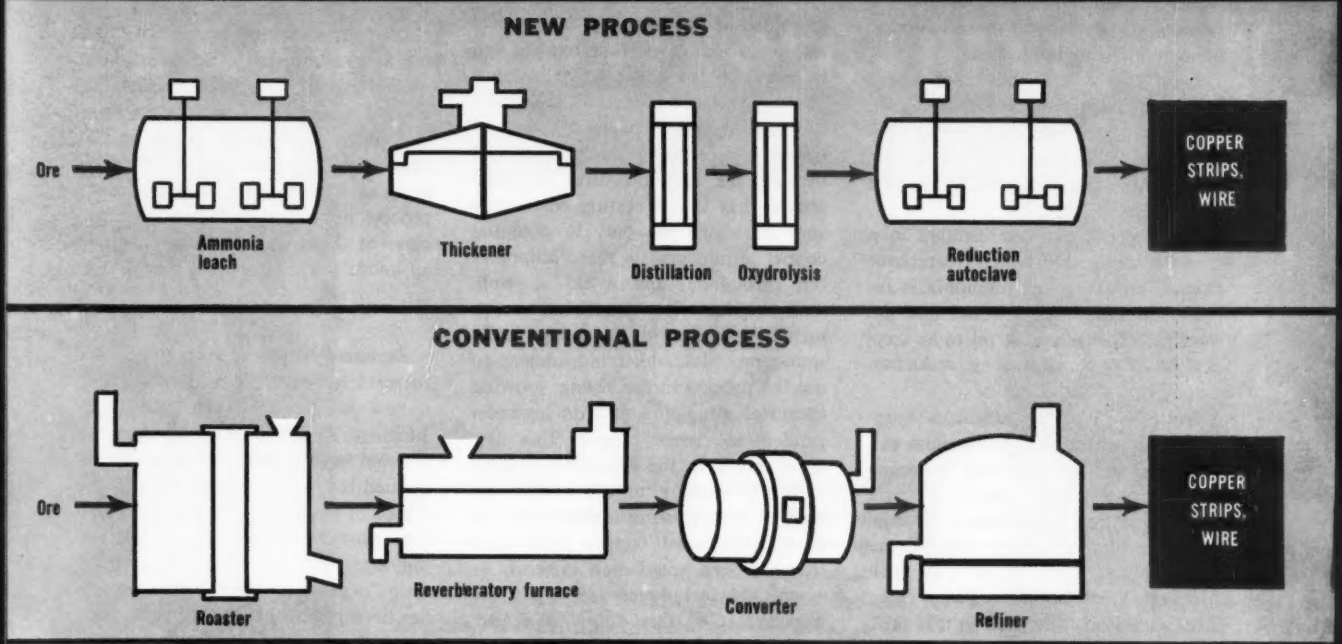


Chemical Copper Chalks Up First Customer

A new copper process that employs none of the usual smelting and refining steps got the go-ahead last week for use in a $23-million, 42-tons/-day plant in the Philippines (CW Technology Newsletter, Feb. 4). As the diagram above shows, many basic copper-making steps are replaced by chemical operations in the proposed plant, which will do the full job of converting low-grade ores into high-quality copper strips, tubing and wire.

The novel, all-chemical route may open an attractive process to copper companies. It's particularly advantageous for small-investment, low-capacity facilities. Moreover, it pulls new raw materials, new equipment and new by-products into the copper production picture, eliminates the costly smelting and refining furnaces.

Another plus reported for this process, one that's taking on increasing significance: there is said to be little or no air pollution or stream pollution by effluent.

Due in Two Years: The plant, designed by Foster Wheeler Corp. (New York) for Marinduque Iron Mines Agents, Inc. (Iligan Bay, Mindanao Island), will require 75 tons/day of ammonia and 4 tons/day of hydrogen; the products include 42 tons/-day of 99.95%-pure copper, 275 tons/day of ammonium sulfate, which will be used as fertilizer, and zinc and iron oxides. Onstream date: about '63.

The small size of the plant points up the process's most significant advantage—that of making small-investment, small-capacity copper plants pay off. Marinduque's works is designed to do the job of a conventional copper plant but to be economical at one-fifth the capacity, one-sixth the investment of conventional plants. They can't be made worthwhile unless they turn out about 200 tons/-day (such units cost $150 million).

The rolling and fabricating equipment, which will turn the final product —powdered copper—into strip form, was developed and will be furnished by E. W. Bliss Co. (Canton, O.) (*CW, Sept. 20, '58, p. 69*). Cost: about 50% less than usual strip-making facilities, which start with cake, ingot or billet.

Besides these advantages, the process will draw attention because a number of patented inventions for extracting copper by chemical means will get further commercial testing, and these will be available for licensing. Also, it is now economically possible to make high-grade copper products from virtually any starting materials now used in the copper industry.

Complex ores, such as the zinc-copper complex that will feed the new plant, can be handled more effectively than by conventional methods.

How It Works: Raw materials for the process are the ore, ammonia and hydrogen. Actually, two ores will be used, one with a composition of about 25% copper and the other 16% copper and 14% zinc. The ore is mined in the Philippines, then barged about 600 miles to the plant. Proved ore reserves will last 15 years at projected production levels, and it is estimated that an additional 15-30 years' ore supply are at the same mines.

The ore is concentrated by standard crushing and flotation techniques

and then is fed into a pressure vessel. There, under ammonia and air at 125-psi. pressure, the copper and zinc go into solution. Some sulfur in the ore is converted into sulfate, and the remaining portion forms a residue along with iron impurities.

Next step is in a thickener where the iron oxide and sulfur settle to the bottom, are removed and filtered. Overflowing the thickener, the copper and zinc solution is moved to the next operation.

The solution is then distilled in a six-plate distillation system to recover excess ammonia. The ammonia is recycled to the leaching vessel and the metallic solution is sent on to an oxydrolysis step and then a reduction autoclave.

In these steps the sulfur is completely converted into ammonium sulfate, and in the autoclave hydrogen reduces the copper oxide to pure copper powder. This copper is then compacted into sheets or wire via the Bliss process.

Many Contributors: Two other firms are closely involved in this project: Chemetals Corp. (New York) and Sherritt Gordon Mines Ltd. (Toronto). Chemetals, 20% of which is owned by E. W. Bliss, is responsible for part of the chemical extraction and direct hydrogen-reduction technology. This firm has exclusive world rights for the copper process and it is offering these rights for licensing.

Sherritt Gordon also worked on this technology; at present it is using an almost identical process in a nickel plant. The only modifications needed to shift the process from nickel to copper were simplifications—copper is easier to produce than nickel; it separates out from impurities faster.

Not only is the process similar to an existing one, but also all the steps have been used individually in commercially operating North American plants. However, never before have they been put together as in the new plant.

Sherritt Gordon has run its 50-tons/day nickel plant (Fort Saskatchewan, Alta.) to produce copper and thus prove the workability of the new scheme. A pilot facility will be built there to run samples of the Philippine ores to provide design data for the new plant.

Economics: Immediate and dramatic improvements in the Philippines economy are expected once the plant starts operation. For the first time, the island republic will be able to meet all its copper requirements and at the same time it will fill a strong need for fertilizer for its rice and sugar industries. Employment will be provided for about 1,000 persons, counting related industrial growth.

Because little electric power is needed for refining the copper and because the easy-to-control chemical process has low operating costs, it is very attractive not only to potential copper producers in the Philippines but throughout the world as well. And the fact that small, low-investment plants would be economically sound provides added inducement to use the process in the young, growing countries struggling to gain an independent source of copper. This new plant should be the beginning of some wide eye-opening in the copper industry. It culminates a steady shift to chemically based copper production that has been noted even in the U.S., where old techniques are firmly entrenched (*CW, Oct. 8, p. 72*). And, because a chemical process lends itself to precise control, the process techniques may help copper producers solve cost problems.

Quick Switch

Silicon transistors made by the epitaxial process developed by Bell Laboratories are now being turned out on a commercial scale by Texas Instruments. In this new process a very thin layer of single-crystal silicon is put on a substratum by vapor deposition, then two successive layers are added by diffusion inside this layer. Result: a transistor that performs its switching function in 24 billionths of a second—less than half the time needed by conventional units.

Texas Instruments says it has adapted existing production lines to the new process, turning out transistors designed primarily for electronic computers.

The improved transistors are priced competitively with conventional types, ranging between $8 and $25 each, depending on quantity. Because the new crystals are virtually insensitive to temperature, the transistors give extremely fast performance throughout the wide temperature range of 120-350 F.

PROCESSES

Oil-Made Anodes: A new use for petroleum coke has been described by the Hungarian Academy of Sciences—it serves as anodes for the Soderberg electrolytic aluminum process. According to an Academy of Sciences paper, 25.5 tons of petroleum coke-based anodes have been used in a commercial plant with no ill effects to the aluminum, although the sulfur was as high as 6%. In the two-step anode process petroleum coke was first calcined at about 1500 F, then made into an anode paste by mixing it with coal tar.

•

Japanese Isoprene: Isobutylene and formaldehyde are the feed materials in a new isoprene process claimed by Idemitsu Kosan, a large Japanese petroleum refiner. Since the company has applied for patents, it will not disclose details of the process except to say that the isoprene is formed by heating isobutylene and formaldehyde together over "organic catalysts." The process has been proved in a pilot plant with a capacity of about 10 lbs./hour, and Idemitsu Kosan is designing an $11.1-million, 40,000-tons/year plant based on the process. This commercial unit is expected to start up next summer.

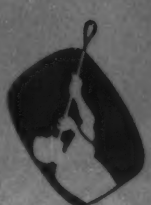
•

Uranium Monocarbide: Now available from a just-modified process are laboratory quantities of uranium monocarbide, a relatively new, high-temperature nuclear reactor fuel made by Vitro Corp. of America (West Orange, N.J.). The fuel has attractive properties in that it combines high values of thermal conductivity, melting point and uranium density with irradiation stability. The new proprietary process is said to be a type of gas-fed, high-intensity arc system that uses a nonconsumable anode. Advantage of the process: the product is made in granule or high-density spherical form ranging from 200 mesh to 5/16-in. diameter in size. This shape and size is potentially cost-saving for fabricators of the nuclear fuel elements, since it could eliminate the grinding, compressing, high-temperature melting and casting steps.

Vitro Corp. will have to wait for industry's response to its sample products to determine which form of the products is to be made in commerical quantities.

Great names of industry protect precious trademarks with

J. T. BAKER PROCESSING CHEMICALS



J.T.Baker CHEMICAL

Extremely high standards of purity and uniformity at competitive prices. These are three reasons great names of industry specify J. T. Baker processing chemicals. They know J. T. Baker precision tonnage chemicals help them manufacture finer products faster at less cost . . . help them safeguard their precious trademarks.

For more than a half-century, J. T. Baker has worked with purchasing, scientific and production executives to supply processing chemicals controlled to predetermined specifications. Whether you use Baker chemicals as starting materials, intermediates or ingredients, you will find they perform smoothly . . . minimize variables . . . reduce costs and rejections.

A few world-famous trademarks of J. T. Baker customers appear on this page. On the following pages, five great firms explain how J. T. Baker industrial chemicals benefit them in their respective industries. We believe you will find their experiences interesting and rewarding.

J. T. Baker Chemical Co.

Phillipsburg, New Jersey

Precision industries benefit from

BAKER PROCESSING

FIVE GREAT NAMES of industry and their world-famous trademarks appear on this and the following page. They are among the hundreds of firms that specify J. T. Baker processing chemicals.

Each firm, naturally, differs in its needs. But each specifies J. T. Baker for the same basic reasons:

> J. T. Baker industrial chemicals are manufactured to extremely high, defined standards of purity and physical uniformity ton after ton. They are competitively priced. They provide the key to faster, more efficient, more profitable processing.

To quote Polaroid Corporation: *"You have given us good reason to rely on the purity and uniformity of the processing chemicals you supply us in tonnage."* Other expressions of satisfaction appear below—from Pfizer, Texas Instruments, and McGraw-Edison.

Perhaps you, too, can more profitably safeguard your product and precious trademark with J. T. Baker processing chemicals. Needless to say, we would always consider your trademark as precious as our own.

"...you have given us good reason to rely on the purity and uniformity of the processing chemicals you have supplied us in tonnage."

J.T.Baker CHEMICAL

A CLICK OF THE SHUTTER ... 10 seconds later a photograph of brilliance and clarity. That's the marvel of the Polaroid Land Camera.

To quote Polaroid, *"This high quality demands unfailing purity of the processing reagents "built into" the picture rolls."*

As a supplier of these processing chemicals, J. T. Baker is proud of the words "unfailing purity." To quote again from Polaroid's letter, *"... you have given us good reason to rely on the purity and uniformity of the processing chemicals you have supplied us in tonnage."*

J. T. Baker is equally proud of the word "tonnage." We are proud of our ability to manufacture processing chemicals of unfailing purity and uniformity in any desired quantity—and at competitive prices.

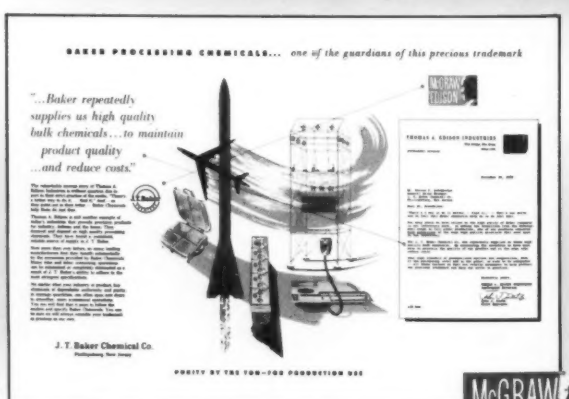
May we suggest you investigate the advantages and economies of J. T. Baker Purity by the Ton for your operation? In industry after industry, these high quality chemicals increase processing speed... reduce costs... minimize variables... eliminate purification steps... reduce rejections. You can be certain, too, of on-time deliveries and attentive, competent service.

Needless to say, if we are honored with your business, we shall always regard your trademark as precious as our own.

J. T. Baker Chemical Co.
Phillipsburg, New Jersey

BAKER PROCESSING CHEMICALS... one of the guardians of this precious trademark
"We have a high regard for Baker production chemicals and Baker services."
Pfizer
J. T. Baker Chemical Co.
PURITY BY THE TON—FOR PRODUCTION USE

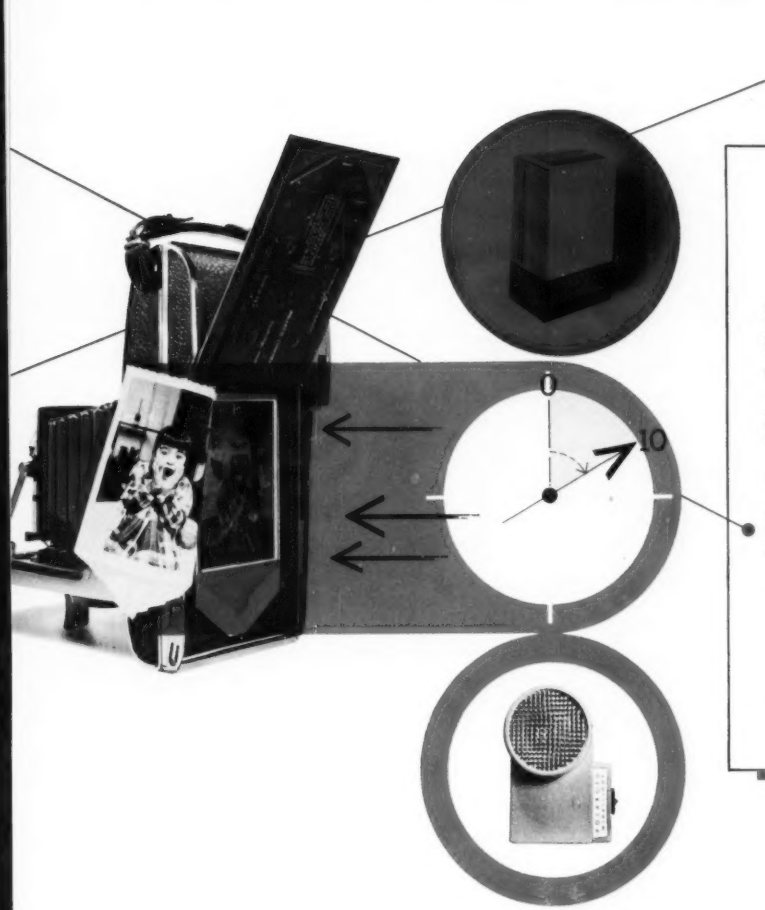
PFIZER—"We have a high regard for Baker production chemicals and Baker services."


BAKER PROCESSING CHEMICALS... one of the guardians of this precious trademark
"...Baker repeatedly supplies us high quality bulk chemicals... to maintain product quality ...and reduce costs."
J. T. Baker Chemical Co.
PURITY BY THE TON—FOR PRODUCTION USE

McGRAW-EDISON—"Baker repeatedly supplies us high quality bulk chemicals. By minimizing variables we have been able to maintain the quality of our product and at the same time reduce costs."

J. T. BAKER *precision processing chemicals*

HEMICALS... *one of the guardians of this precious trademark*



POLAROID CORPORATION

CAMBRIDGE 39, MASSACHUSETTS

October 6, 1960

Mr. Warren F. Schumacher
Vice President in Charge of Sales
J. T. Baker Chemical Co.
Phillipsburg, New Jersey

Dear Mr. Schumacher:

The outstanding success of the Polaroid Land Camera is due, first, to its convenience – the user can snap and develop a picture in just 10 seconds; and second, to the brilliance, sharpness and range of tone of the finished photograph.

Needless to say, this high quality demands unfailing purity of the processing reagents "built into" the picture rolls.

Over a period of many years you have given us good reason to rely on the purity and uniformity of the processing chemicals you have supplied to us in tonnage. Again and again you have also given us good reason to appreciate the reliability of your deliveries, and the alertness and dependability of your sales representatives.

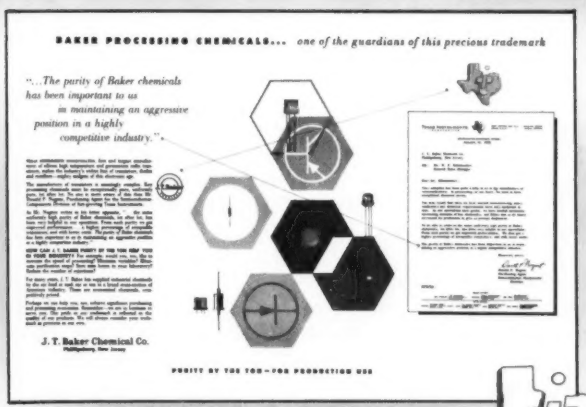
We are pleased to have this opportunity to express our satisfaction with this long-standing relationship.

Sincerely yours,

Paul E. Sullivan
Asst. Vice President - Purchasing

PES/ft

PURITY BY THE TON—FOR PRODUCTION USE


BAKER PROCESSING CHEMICALS... one of the guardians of this precious trademark
"...The purity of Baker chemicals has been important to us in maintaining an aggressive position in a highly competitive industry."
J. T. Baker Chemical Co.
PURITY BY THE TON—FOR PRODUCTION USE

TEXAS INSTRUMENTS—"The purity of Baker chemicals has been important to us in maintaining an aggressive position in a highly competitive industry."

. . . costs are lower because process stages are saved

Many buyers associate precision quality in processing chemicals with high price. This need not be so. J. T. Baker precision chemicals are competitively priced. Their *controlled* purity and uniformity often save the user a purification or processing step – which further reduces their cost.

If starting materials of controlled quality are essential for your operation, J. T. Baker may be able to make your production job easier . . . faster . . . more profitable. You can be sure, too, of on-time shipments and expert, attentive service.

J. T. Baker Chemical Co.
Phillipsburg, New Jersey

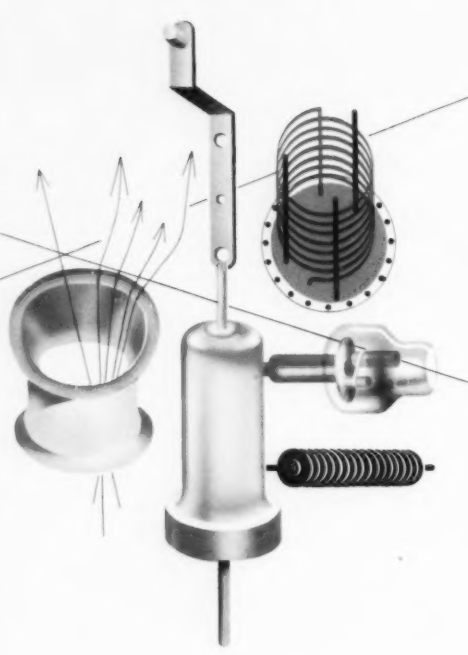
J.T.Baker CHEMICAL

J. T. BAKER PURITY BY THE TON

. . . the key to reduced manufacturing costs

BAKER PROCESSING CHEMICALS... *one of the guardians of this precious trademark*

"...the purity and uniformity of your product...made possible important purchasing and processing economies."



FANSTEEL METALLURGICAL CORPORATION

August 4, 1954

Mr. Warren F. Schumacher
Sales Manager
Fine & Industrial Chemical Division
J. T. Baker Chemical Company
Phillipsburg, New Jersey

Dear Mr. Schumacher:

The production by Fansteel of refractory metals, such as tantalum, tungsten and molybdenum, is recognized as one of America's basic industries. Particularly important to us is molybdenum, which we refine to the pure metal from the type of molybdic oxide you supply.

The quality of the molybdic oxide we use is, therefore, of the greatest concern. It is the high purity and uniformity of your product lot after lot which made possible the cooperative effort between your firm and mine, resulting in the development of important purchasing and processing economies. This is equally true for the other raw materials you supply us.

Your system of precise manufacturing controls, plus your accurate testing and thorough blending, permit us to process lots of molybdic oxide many times larger than before. This has greatly reduced our testing time — and one pilot run now takes the place of five. The estimated annual savings run into many thousands of dollars.

The result has been more economical use of equipment, less work for our chemical and metallurgical laboratories, greater continuity of production, and a feeling of increased satisfaction.

Sincerely,

Joseph A. Teece

JOSEPH A. TEECE
Vice-President
Director of Purchases

JAT:N

THE CONQUEST OF THE REFRACTORY METALS—such as tantalum, tungsten and molybdenum—represents a triumph of modern metallurgical science. Inseparable from the story of their development is the name Fansteel Metallurgical Corporation.

As Fansteel points out in their letter opposite, proper starting materials are particularly important in their processing. To quote: "The quality of the molybdic oxide we use is of the greatest concern. *The purity and uniformity of your product made possible the development of important purchasing and processing economies.*"

This letter is a matter of great personal pride to us at Baker. For many years Baker has supplied many of America's leading industries with precision industrial chemicals in tonnage quantities at competitive prices—firms like Fansteel who insist on the finest.

Perhaps a change in your present procurement procedures would result in less work for your laboratories, greater continuity of production, a feeling of increased satisfaction, and important purchasing and processing economies.

Baker *Purity by the Ton* may provide the key.

We would be glad to cooperate in a study of the ways Baker industrial chemicals might be used to advantage in your organization. Needless to say, we will always consider your trademark as precious as our own—and safeguard it with equal vigilance.

J. T. Baker Chemical Co.
Phillipsburg, New Jersey

PURITY BY THE TON—FOR PRODUCTION USE

". . . one pilot run now takes the place of five . . . estimated annual savings run into many thousands of dollars."

. . . FANSTEEL METALLURGICAL CORPORATION

Can uniform processing chemicals reduce variables and cut your costs? Many industrial firms answer emphatically—"*Yes! With J. T. Baker's purity by the ton we achieve real processing economies.*"

Fansteel Metallurgical Corporation, for example, realized big savings through purchases of J. T. Baker processing chemicals. To quote: ". . . *the purity and uniformity of your product made possible the development of important purchasing and processing economies . . . One pilot run now takes the place of five. The estimated annual savings run into many thousands of dollars.*"

Perhaps Baker's controlled quality can also achieve important purchasing and processing economies for you . . . perhaps we can manufacture chemicals to your exact specification. We will gladly cooperate in a study of ways J. T. Baker processing chemicals may be used advantageously in your organization.

J. T. Baker Chemical Co.
Phillipsburg, New Jersey

REGIONAL OFFICES: 122 East 42nd Street, New York 17, N. Y. • 435 North Michigan Avenue, Chicago 11, Ill. • 232 N. Lake Avenue, Pasadena, Calif.

Opening New Growth Routes

There's a quiet but significant change taking place these days at Wallace & Tiernan Inc. (Belleville, N.J.). A diversified manufacturer of equipment, chemicals and pharmaceuticals, W&T is now putting stronger emphasis—and a lot of its conservatively acquired money—into the chemicals and drug aspects of its business.

This move for more chemical business will first mean expansion in the company's current fields of chemical operation—plasticizers, pharmaceuticals, alcohols, organic peroxides. W&T's Harchem Division will launch most of the new items, but will likely also try some areas that are new to it.

• Harchem, the major chemical producer, will launch four new products for the plastics industry this year. The first one, an epoxy resin modifier and curing agent tabbed Harcure A, has just been unveiled. Backing it, and the three still-to-be-introduced products, will be the biggest sales effort in Harchem history.

• The drug line will be bolstered by the items made by the newly acquired specialty pharmaceutical producer, R. J. Strasenburgh Co. (Rochester, N.Y.). Strasenburgh's staff will more than double the company's pharmaceutical field detail force.

And there are other chemical expansion angles that are being explored, too—acquisitions, mergers and joint ventures.

More Chemicals: Chemical and pharmaceutical operations once represented only a small proportion of W&T's business. Now they account for over 55% of W&T's $55-million gross sales in '60. And if the company's new push pays off, the chemical and drug operations may account for more than two-thirds of its gross by the late '60s.

In this plan, W&T is, of course, counting on continued growth in its Lucidol Division (producer of organic peroxides) and rapid expansion of its pharmaceutical operations (Maltbie and Strasenburgh). But the keystone of the firm's chemical ambitions remains its biggest and fastest growing chemical division, Harchem. Its goal: to triple Harchem's annual sales within five to eight years, sales that are estimated by CHEMICAL WEEK at $11-14 million this year.

New Look at Harchem: During the past several years, Harchem has taken on a new, aggressive mien. The new mood that pervades the division is perhaps most aptly described by its new president, Bruce Ainsworth: "Today, we have more new people with fresh ideas than ever before, and we have a sympathetic management, more willing to assume many of the inherent risks of the chemical business. With our traditionally solid financing, this opens vast new opportunities for us."

It's no secret that Harchem's growth was relatively slow during the years following its acquisition by W&T. (W&T acquired the W. C. Hardesty Co. and Hardesty Chemical Co. of Dover, O., in '51, later formed the Harchem Division from them.)

The first big change came in '58 when W&T brought in a new corporate vice-president, Charles Rybolt (formerly with the Lucidol Division), to strengthen and coordinate its chemical operations. One of his first tasks was to revitalize the lagging Harchem Division by bringing in new talent, beefing up marketing efforts and research and development activities.

Getting Up Steam: Things began to happen rapidly in '59. Bruce Ainsworth took over as Harchem Division president, and other new people were put in key slots. Soon after that, Harchem revamped parts of its organization, created some new departments —e.g., a purchasing department—to accelerate internal growth.

And a new Product Development Dept., headed by William Wiley, was created to improve the division's handling of promising new products that were beginning to come out of the stepped-up R&D effort.

The field sales team underwent some improvements, too. The addition of five new sales staffers gave Harchem a full dozen fieldmen. They were given responsibility for selling the whole Harchem line of more than 100 products, rather than specializing in either fatty acids (oleic, stearic) or

Harchem's Ainsworth: 'We're looking for tripled sales within 5-8 years.'

'We may grow by many routes—internally, mergers, joint ventures.'

'There's a new spirit at Harchem—one of vigor, youth, new ideas.'

Harchem's other chemical products (plasticizers, curing agents, plastics modifiers), as they had previously.

Under the present arrangement, Harchem sales staffers cover all of the U.S. except the Western Plains and Mountain states west of Minnesota and Texas. The West Coast is well covered through distributors, and Ainsworth says he now plans to fill in his Plains states gap soon. Canadian sales (for both Harchem and Lucidol) are handled by Harchem, Ltd., headquartered in Toronto. There is virtually no export business.

Signs of Success: Already, there are indications that the new look within Harchem is paying off. In '59, for example, Harchem sales and profits rebounded nicely from the drop-off in recession year '58—in fact, established an all-time high for Harchem. In '60, sales volume jumped ahead once more, reaching another division peak, although profits failed to equal '59's record showing.

Prospects for '61 look even better than '60's, according to Ainsworth. One big reason may well be the four new products for the plastic industry.

The first of these, the Harcure A, is a linear polymeric anhydride curing agent and flexibilizer for epoxies, claimed to be a significant departure in epoxy resin modifiers. That's because, says Harchem, Harcure A is a polymeric compound rather than a monomeric material, as most epoxy modifiers are.

Later this year Harchem will launch a series of dimer acid compounds, and a polar polymeric plasticizer for polyvinyl chloride.

The Long Look: Ainsworth sees considerable growth ahead for specialty curing agents and other epoxy specialties. And, he says, Harchem is looking over virtually the whole field of plastics modifiers, including such things as antistatic agents, ultraviolet-light absorbers. Ainsworth also indicates that Harchem's line of plastics industry products will grow more rapidly than its fatty acid list.

As mentioned earlier, Harchem is not limiting its considerations of possible new products to closely related lines. By internal growth or by acquisition, merger, or joint venture, Ainsworth says, Harchem means to triple its sales volume by the late '60s. And parent Wallace & Tiernan couldn't be happier about the prospect.

HF Shipping Shuffle

A major change in shipping practice—nationwide use of tank trucks—is being put into effect by hydrogen fluoride producers. Allied's General Chemical Division is doing the pioneering work, has just started national delivery from eight shipping points in 3,000-gal. (15 net tons) tank trucks.

What's behind the change from the industry's long-established use of drums, cylinders or tank cars? Competition, for one thing. Allied clearly hopes to blunt a sales point now being made by Dixon Chemical & Research, which has an HF plant due onstream this summer. Dixon has been promising freight-equalized national tank-truck shipments. Now, *CW* learns, HF producers already in operation will reveal similar plans within the next few weeks.

Convenience and flexibility are two important talking points for tank transport shipment. The trucks also promise the savings of bulk buying to many who formerly bought by drum or cylinder and to those who lack storage facilities for a rail tanker's 10,000-gal. capacity.

Starting Point: Allied's HF plants are at North Claymont, Del., Nitro, W. Va., and Baton Rouge, La. Bulk delivery terminals are at Pittsburgh, Chicago, Los Angeles, Buffalo and Cleveland. Both anhydrous and aqueous HF will be shipped from these points.

Dixon's new HF plant, in Paulsboro, N.J., will have a capacity of about 10,000 metric tons/year. HF distribution is Dixon's first step into national marketing. Until now it has sold sulfuric acid, aluminum sulfate, etc., regionally.

Producers so far see no price change for HF shipped by tank truck. Since the major cut a year ago (*CW Market Newsletter, Feb. 20, '60*), tank-car prices have been steady and will not be altered for truck delivery.

Total U.S. production of HF last year is estimated at 120,000 tons, up 13% from '59, and the first gain since '56.

The problem shippers face now is to meet the costs of truck delivery. One producer observes, "We aren't overlooking the advantages of smaller-volume trucking to our customers, but we'll avoid long-distance hauling if . . . possible."

McKesson & Robbins' Nolen: New chief for the CPI's top distributor.

New McKesson Chief

McKesson & Robbins, Inc., distributor of chemicals, drugs and liquors, has a new chief executive officer: 59-year-old Herman C. Nolen, president of the firm.

He assumes the top corporate job held since '55 by the present board chairman, George Van Gorder, who will continue to hold the chairmanship.

Before his appointment to the firm's presidency in '56, Nolen served as executive vice-president and before that as vice-president for drug merchandising and drug buying.

Nolen, well known as an after-dinner speaker, has written several books on sales and drugstore management. Before joining McKesson in '47 he was professor of marketing at Ohio State University.

New Gas Data Book

Matheson Co. (East Rutherford, N.J.), distributor and repackager of industrial gases, will soon begin distributing the first copies of a comprehensive new book of gas data that may prove to be as valuable a sales aid as it is a reference book.

The new, 444-page book, "Matheson Gas Data Book," describes the properties and uses of some 81 commercially important industrial gases. It is already regarded by some industrial gas experts as the most comprehensive reference to gas data now available and well worth the $8 tag the company is putting on it.

Broadened Scope: This volume is not Matheson's first effort at compiling gas data. In mid-'48 the company published its first such volume, a collection of fewer than 100 gas data sheets, sold it for $2/copy.

Several years later, this book was augmented with charts and graphs and reissued as a second edition at the same $2 price. It was still under 100 pages long. "This time," according to Matheson's sales promotion manager, Ken Hoag, "we decided to take the old material apart and come up with a new book."

The new, third edition weighs a hefty 2½ lbs./copy, covers many more gases than its predecessors. In fact Matheson omitted only one intentionally—hydrogen cyanide.

In addition to describing some relatively new gases (silicon tetrafluoride, vinyl fluoride, nitrogen tetroxide), the volume ranges broadly in its coverage of pertinent data. Items covered: gas formula and name, synonyms, physical constants, general description, specifications, uses, toxicity, handling and storage precautions, leak detection, materials of construction, cylinders and valves, control apparatus, chemical properties, and detailed thermodynamic properties.

Varied Uses: One reason for compiling the book was to assist the firm's 10 telephone sales staffers who take orders and who face a daily barrage of questions on gas properties. And, of course, the new volume will be useful to purchasing agents, perhaps save them occasional calls for gas facts. Matheson also emphasizes that many safety engineers will profit by having a copy of its gas data book.

Better Rubber Baling

Texas-U.S. Chemical Co. (Port Neches, Tex.) this week disclosed the first details of a newly patented rubber baling machine that may be useful to chemical process companies with similar, hard-to-package materials.

The company, a joint venture of Texaco, Inc., and U.S. Rubber Co., says its new baling machine wraps the rubbery materials in various plastic films. Swathing such products in plastic has been tried before, but the packages often broke because of cold flow of the contents.

The new machine overcomes these problems by heat-sealing the rubber bales between two sheets of thermoplastic film (polyethylene, polyethylene-isobutylene blend, or biaxially oriented polystyrene). The job is completed in one pass through the machine, and the advantage stems from sealing the bale while allowing considerable space on all sides for in-transit bale movement without breaking the film. Virtually any material with plastic "memory," a tendency to swell, or high flow characteristics can be packaged by the new device.

Previous methods of closely wrapping rubber bales in sheets of polyethylene resulted in extensive amounts of film breakage. Already, most U.S. rubber producers are inspecting the new machine, and Texas-U.S. is eager to get them to try it.

The company figures that some 875,000 long tons of styrene-butadiene rubber (SBR) were wrapped in such polyethylene-covered bales and stacked in large (1-ton) cardboard containers for shipment last year. Butyl and some of the tackier stereospecific rubber materials are also considered good possibilities for the new rig.

The machine, which costs about $13,000, is currently used with polyethylene film 1½ mils thick. However, it can handle 10-mil films.

DATA DIGEST

• **Acetal Resin:** Bulletin (No. A-18404) describes a new thermoplastic, a highly crystalline, stable form of polymerized formaldehyde. Charts outline strength, resilience, fatigue, resistance and other physical and chemical properties. Injection, extrusion and other forming techniques are discussed. Polychemicals Dept., Du Pont. (Wilmington 98, Del.).

• **Fungicide:** Technical-data sheet outlines uses for bis-(tri-n-butyltin) oxide as control for fungi, bacteria, algae and marine organisms. Additional information and samples are available. Metal & Thermit Corp. (Rahway, N.J.).

• **Latex Guide:** Eight-page booklet lists physical properties and suggested applications for more than a score of synthetic latexes. Data include descriptions of latex types such as "hot," "cold," copolymer, terpolymer, resin, creamed and centrifuged. Sales Promotion Dept., Naugatuck Chemical Division, U.S. Rubber Co. (Naugatuck, Conn.).

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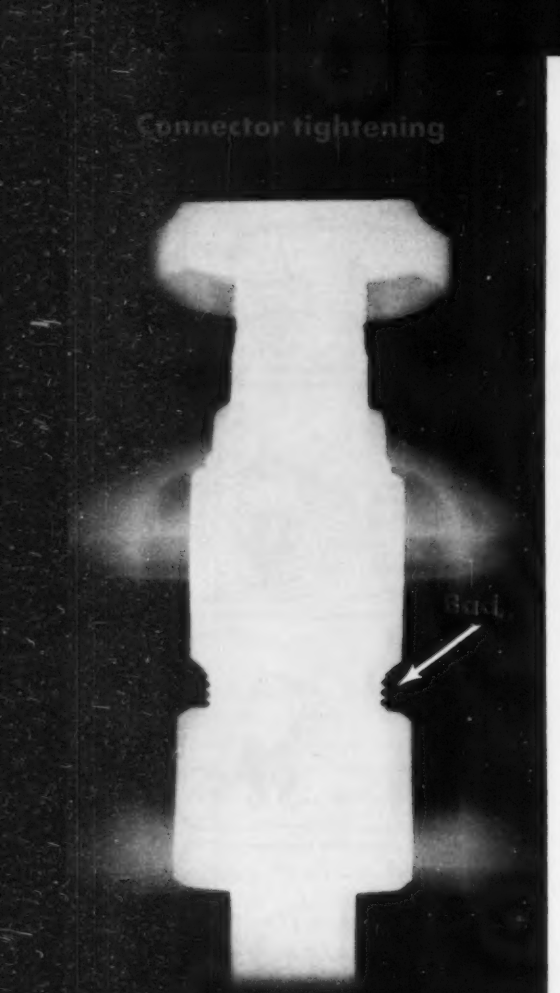
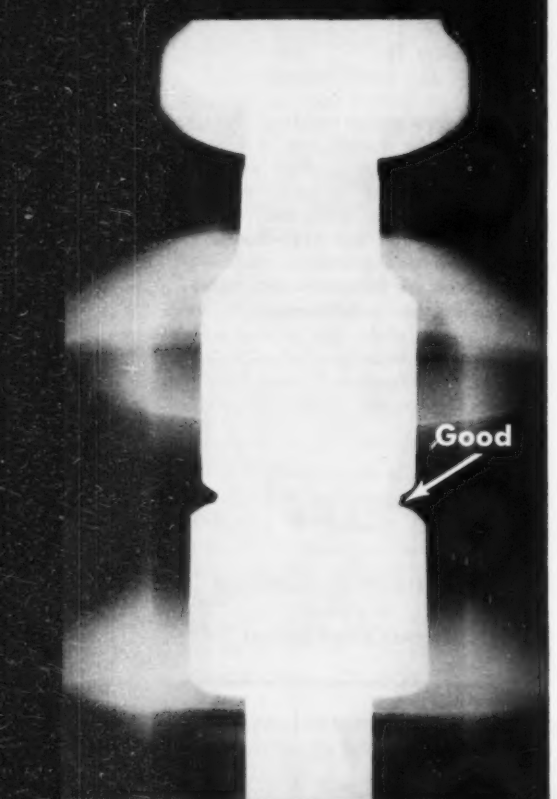
X Rays Bare Hidden



Tell-tale threads (top) show that connector nut has not been tightened; conductor has not been wedged into connector.



Examining X-ray photographs like those shown here, engineers at the New York meeting of the American Institute of Electrical Engineers last week got their first look at a novel analysis technique developed by Du Pont's Engineering Service Division. It's believed to be the first nondestructive method of inspecting high-voltage electrical terminations and cable splices, and has, moreover, clearly showed how to do better work.

The technique uncovers difficult-to-detect defects, so that they can be corrected before they cause costly emergency power failures. It uses conventional X-ray equipment. Plant technicians can be trained within a few hours to do the work. And the radiographs can be developed by methods in general use in medical X-ray laboratories.

Usual high-voltage testing — checking for leakage by system isolation and application of high voltages — detects gradual deterioration of insulation resistance, but it finds only some weaknesses in material or method of installation. And the likelihood of its spotting defects immediately after installation of the termination or cable splice is slight.

Forestalled Trouble: The dollar value to process management of catching defective work before it causes trouble is hard to pinpoint. For one thing, most of the process industries' electrical systems are arranged so that other lines will take over the load, or at least be unaffected by the shutdown of one circuit segment. The problem is that the single opening and almost-immediate reclosing of a breaker while the fault is being isolated can cause some process shutdowns or affect instrument calibration and process quality control. It is a major part of the problem of electrical system reliability that many chemical company engineers are now concentrating on (*CW, Jan. 21, p. 37*).

Moreover, some of the failures can be violent. High-voltage (15 kv. and above) terminations (commonly called potheads) and splices sometimes explode. Aside from the hazard of such breakdowns, they are troublesome because they leave no way to determine the exact causes of the failures.

Du Pont plants had three major power failures last year attributed to pothead failure. "From a statistical standpoint, the number of failures has not been high; from an economic standpoint, the failures have been very costly," says Tel Bourbonnais, ESD maintenance group engineer.

Workmanship on the Spot: About 250 radiographs have been taken at various Du Pont plants during the past year to check out the new technique. The radiographs showed defects in 95% of all terminations. The terminations checked were made by Du Pont's own cable splicers, by those of utilities serving the plants and by construction mechanics of local contractors—"a representative sample of termination and cable-splicing techniques used throughout the country," says Bourbonnais. And no group did flawless work, although Bourbonnais is quick to point out that many of the defects are probably insignificant.

But too many can be serious, and the causes for such mistakes are widespread. Among the factors: differences in cable sizes (e.g., 15-kv. and 45-kv. cables are common in most distribution systems), differences in the hardware of various manufacturers and differences in methods of assembly and mechanics' workmanship.

In some cases improper materials have been used (e.g., an aluminum sleeve used with a copper conductor), or potheads have been assembled incorrectly and mechanical connections improperly tightened.

Sometimes "stress cones" haven't been used — as they should be — on shielded-cable potheads, or shielding tape on stress cones has been improperly applied. (Stress cones are used on shielded-cable potheads to separate lines of electrical force at the end of the groundwire mesh. This reduces the chances of a cable-to-ground short as insulation gradually deteriorates with age. The stress cones, one and a half to two times the diameter of the cable, are made by separating the copper mesh in the cable; the cone so formed is insulated with rubber.)

Voids in potheads are another ma-

Electrical Faults

jor defect that can lead to failures. Voids are caused by shrinkage of potting (sealing) compound that is poured into the space between the electrical cable and the porcelain cap that surrounds it.

A small amount of shrinkage is probably desirable; it provides room for expansion of the compound as temperatures rise. But excessive shrinkage results in a powerful vacuum that pulls air in around the conductor and down into the top of the pothead. If a seal is not maintained by the compound the pothead will "breathe," draw water (from condensation resulting from temperature changes and from rain) down into the void. Water-filled voids can cause pothead failures.

In the Beginning: The idea of X-ray analysis grew out of a study of cable splices made several years ago by one of Du Pont's engineers, Bill Dechant —but the technique was almost abandoned because of inconclusive results. However, in Nov. '59 at a top-level meeting on maintenance problems, the radiographs of cable splices made during the study drew the attention of a plant maintenance supervisor. His plant was having pothead troubles and he wondered if potheads could be X-rayed.

"We took a series of radiographs of a number of potheads and, to my surprise, found that a trained eye could identify what was inside them as easily as if they were made of plate glass," says Bourbonnais.

The attention that has been drawn to the quality of pothead workmanship has led to Du Pont's electrical design group's setting up new specifications for cable terminations. In many aspects these differ from those that have been used. Also, the Design Division developed a training program for construction and plant personnel covering the recommended techniques for cable splicing.

The fact that work can be inspected after it has been sealed up has a marked psychological effect. "We have taken considerable trouble to show pictures to the mechanics who have done the work," says Bourbonnais. Many mechanics have difficulty believing that their handiwork can result in the defects until they actually see them. But once they are shown how to avoid the trouble spots they greatly improve their work, Bourbonnais adds.

The radiographs can save unnecessary repairs, too. For example, the armor of one aerial cable ruptured after six months' service, and maintenance supervisors expected to find trouble. However, X-ray analysis showed that the splice was satisfactory. Only weatherproof tape over the armor rupture was needed to put the cable back into service.

One of the outstanding features of the X-ray technique is its simplicity. For example, Bourbonnais gave instructions over the phone within a few minutes to one engineer wanting to take a radiograph of a pothead.

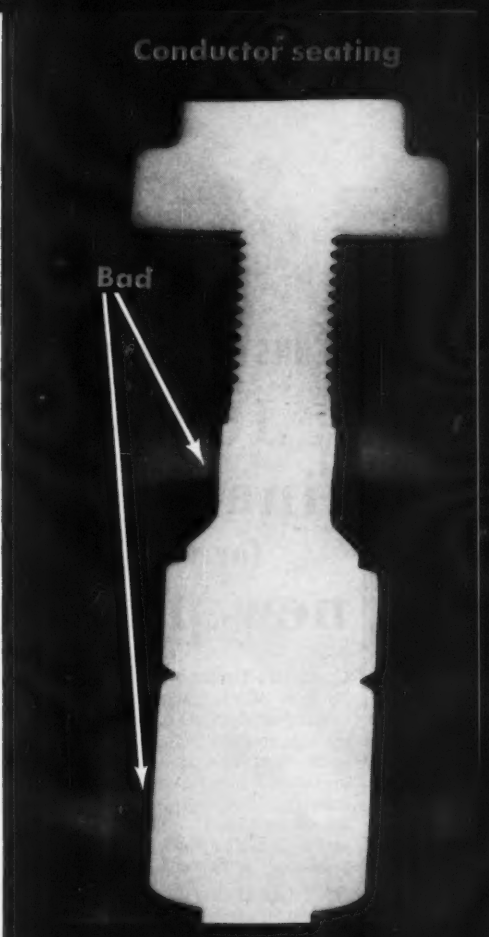
Safety precautions probably caused the biggest worries at first. They are easily solved. A film badge or dosimeter is worn by the technician to check the total radiation absorbed. ESD's unit has a 50-ft. cable between the pothead and the X-ray's unit's control box. This allows the operator to stand more than the safe distance normally required according to radiation meter checks.

A typical X-ray unit, the Balteau Spot 140 made by Balteau Electric Corp. and marketed by Westinghouse Electric, sells for about $2,700. It's portable, weighs about 70 lbs., operates on 110-volt, single-phase 60-cycle current. Similar units are made by General Electric, Philips Electronics and Picker X-Ray. Westinghouse units may be rented on a monthly basis for about 4% of list price.

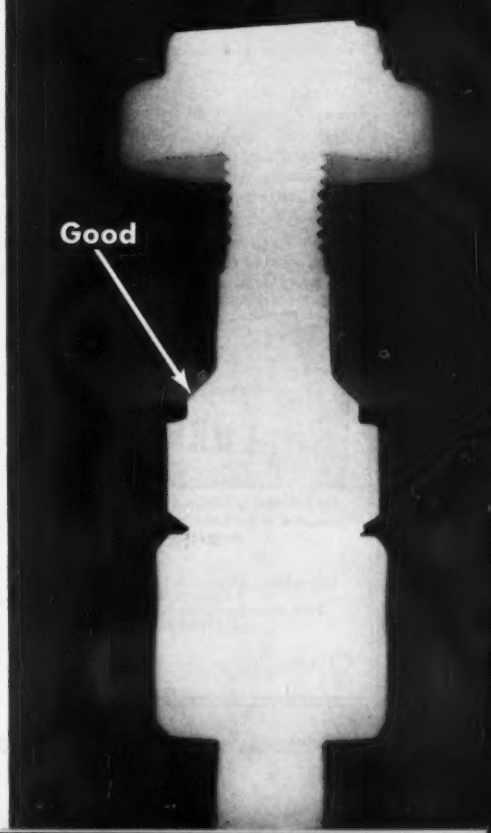
Firms offer X-ray analysis services in many areas—particularly near aircraft makers. Darkroom facilities can be set up for $300-$500.

Iridium isotope cameras can be used instead of X-ray units, sell for about half the price. But because radiation intensity changes continually, greater skill is needed for their operation. Camera makers include Picker, Curtiss-Wright and The Budd Co.

The simplicity and effectiveness of the X-ray technique seem certain to assure wide acceptance, could make many pothead and cable-splice failures a thing of the past.



Connector not properly seated in porcelain cap (top) leaves space for moisture between connector and cap, forces connector off to left.



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EQUIPMENT

Vibration Pad: Consolidated Kinetics Corp. (1065 Dublin Rd., Columbus 12, O.) has a new high-density glass-fiber pad for isolation of vibrating machinery. Pads do not have to be sawed or cemented in place, are guaranteed by CKC not to "creep." They come in 18x18x½-in. sheets that are prescored at 2-in. intervals so they can be cut at the job site.

•

Booster Pump: Peerless Pump, Hydrodynamics Division of Food Machinery and Chemical Corp. (301 West Ave. 26, Los Angeles 31), is offering the Hydro-Boost, a new submersible turbine-type pump of compact design for boosting system pressure that fits into the distributing line. The unit is sized for lines up to 16-in. diameter, has a capacity up to 8,000 gpm., with heads to 1,000 ft. Motor sizes are available up to 350 hp.

•

Nuclear Welding Wire: All-State Welding Alloys Co.'s (249-55 Ferris Ave., White Plains, N. Y.) aluminum welding and brazing alloys Nos. 718, 1100 and 4043 now have "nuclear grade" certification. The alloys, in wire spools and cut-length rods, can be used in atomic-reactor and radiochemical equipment fabrication. They contain 0.008% maximum lithium, 0.001% maximum cadmium, boron and cobalt.

•

Insulation Tester: A portable, hand-crank dc. tester for electrical insulation resistance is a new product of Multi-Amp Electronic Corp. (465 Lehigh Ave., Union, N. J.). The tester, called Type M, weighs 5 lbs., is available in four rated voltages and five resistance ranges — 1,000v/2,000 megohms; 500v/1,000 megohms; 500v/100 megohms; 250v/50 megohms; 100v/20 megohms. Accuracy is within ±5% of rated resistance.

•

Gas-Turbine Drives: Morse Chain Co. (Ithaca, N. Y.) is marketing chain drives for transmitting power from small (30 to 1,800 hp), two-shaft gas turbines to auxiliaries such as lubricating oil pumps, fuel pumps, alternators, generators, cooling fans, governors, power take-offs, starters. The drives fill the transmission gap between low-speed roller chain and high-speed gearing.

Designer Bier holds cut-away model of new valve with no organic seals.

Casting a New Valve

George Bier, president of Polymet Co. (Orange, N. J.), has designed a new solenoid-operated, floating-disk-type gate valve, hopes to sell it in the chemical industry. The device's principal advantage: it has no organic seals that can be attacked by chemicals. And its straight-through-flow design is said to eliminate big pressure drops during operation.

Bier, now in pilot production of the valve, explains that he developed it from his work in permanent-mold casting (he's a designer and maker of molds and tools). In his patent-applied-for process, he casts a pressure-tight body of aluminum around the stainless-steel valve parts—i.e., plunger, seats, plunger guide and stationary core. (The sealing disc in the plunger is made of graphite or Pyroceram 9606.)

Ordinarily, valves must be assembled inside the body, depend on organic seals between the parts and the body for a pressure-tight seal.

Although aluminum is so far the only material used for the body, Bier feels he can use brass and alloys, which have lower melting points than the stainless-steel valve parts. Port sizes up to ½ in. are practical for direct-operating valves; larger models would have to be pilot operated.

The valves will withstand pressures to 5,000 psi., temperatures to 900 F with gravity-type return. Valves with spring-type returns have an operating limit of 500 F.

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Technology
Newsletter

CHEMICAL WEEK
February 11, 1961

A new device for continuous conditioning of flowing solids has been developed by the Johnson-March Corp. (Philadelphia). Uses for the patented unit, called the Verticone, have been researched by The Franklin Institute, include: (1) addition of a specified moisture content to solids; (2) coating of granules and flakes with dyes and coloring agents; (3) prewetting of solids; (4) making suspensions; (5) controlling dustiness of dry materials.

The unit eliminates the need for tumbling drums, pug mills and similar equipment that prevents many solids-handling processes from becoming continuous operations. But it is not being billed as a replacement for equipment that performs intimate mixing operations.

The basic patent covers a method of continuous pouring of solid particles over a cone to form a continuous hollow cylinder of falling solids no more than ¼ in. thick. Either liquid or another solid may be sprayed into the falling material from a nozzle positioned below the cone.

•

First multivalent "staph" vaccine for dairy herds has been developed by Jensen-Salsbery Laboratories, Inc. (Kansas City, Mo.). Named Staphoid A-B, the new toxoid is a combination of 101 staph strains taken from cows with chronic staphylococcal mastitis. The viruses are inactivated with β-propiolactone.

•

New dealkylation processes for producing benzene naphthalene from aromatic refinery products are being readied for commercial entry. Such processes are reported under development by Humble Oil, Sun Oil, and by Union Oil teamed with Tidewater Oil. These are in addition to processes already reported: Universal Oil Products' Hydeal and Houdry's Detol (*CW Technology Newsletter, Feb. 4*).

Most of these processes are said to be based on thermal dealkylation with hydrogen (hydrodealkylation) at temperatures in excess of 1000 F. This contrasts with the catalytic processes of UOP and Houdry. Successful commercialization of a thermal process is said to be tricky. Although the chemical reactions are well known, process design is complicated by the high temperatures, speed of the reaction and heat generated in the reaction.

•

Significantly closer research coordination is planned between Monsanto and Chemstrand, according to Chemstrand President Edward O'Neal. Factors that are encouraging the closer tie: last week's dedication of the new Chemstrand research center at the North Carolina Research Triangle Park (Durham) and the recent acquisition by Monsanto of American Viscose's original interest in Chemstrand. O'Neal told CHEMICAL WEEK that the tie would not be restricted to any one Monsanto division (e.g., research), but would be company-wide. One of the first

fruits of the closer relationship is a new Chemstrand program of providing researchers with a "technical ladder" for advancement parallel to the administrative ladder. Monsanto has had such a program for some time.

•

A new process to convert paper into narrow yarns strong enough to be knitted or woven into reusable fabrics has been developed by Ronald Marks, president of Enterprise Inc. (Dallas, Tex.). So far, several large firms have licensed the process—among them Continental Can and Dan River Mills—and American Cyanamid is treating the paper yarn with a wet-strength resin, aiming to make an inexpensive, durable fabric. Potential uses of the paper yarns are said to range from pants to parachutes.

•

Hercules' high-energy solid propellant is better known this week on the heels of last week's successful firing of the Minuteman. It had been known that Hercules was souping up double-base propellants (a mixture of nitroglycerin and nitrocellulose) by adding ammonium perchlorate as additional oxidizer (*CW, Aug. 27, '60, p. 54*). Now the firm reveals it also adds aluminum. The charge, bonded to a Spiralloy glass-reinforced epoxy, forms the third stage of the Minuteman. It's made by Hercules at its plant in Bacchus, Utah.

•

New test results on wild-oat herbicides indicate that the compounds are effective but must be applied with great care. The University of California tested Spencer Chemical's Carbyne and Monsanto Chemical's Adavex (*CW Technology Newsletter, Oct. 24 and Dec. 12, '59*) against wild oats in barley and wheat at 28 locations in California. Both weeds and crops showed varying amounts of damage, depending on the amount of herbicide used.

Increasing dosages of Adavex—mixed with the soil at planting time—injured the crop from slightly to severely, but only at the highest rates was the yield lower than in weed-infested control areas. Carbyne, a postemergence spray, stunted the oats, allowing the crop to get a vital growth advantage. In cases of excessive application it damaged the crop too.

•

A mixed-base sulfite pulping process is superior to unmixed sodium, ammonium, or calcium sulfite wood pulping, according to experiments performed by Columbia Cellulose Co. (Vancouver, B.C.). The trend in pulping plants is away from calcium-based plants, which have pollution problems, toward sodium and, in the future, ammonium plants. The experiments show that the α-cellulose content, which is indicative of fiber quality, is just as high with a mixed base as with either sodium and ammonium liquors and superior to calcium systems. Over-all results, even though the cooking time was slightly longer, were said to be far more economical with the mixed-base. (A mixed-base process involve a combination of either sodium, aluminum, calcium or magnesium.)

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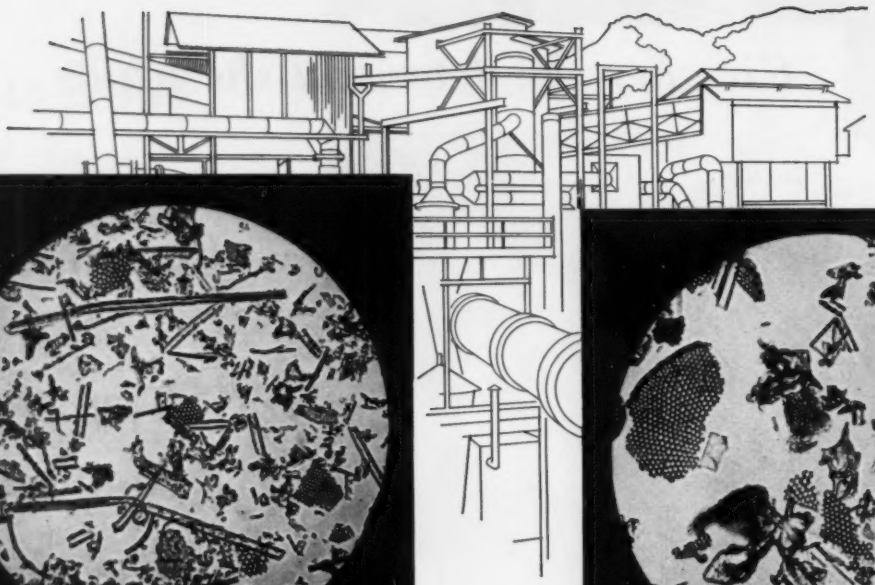
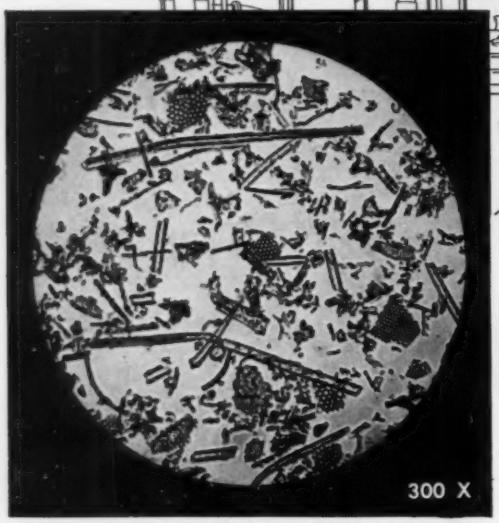


Milling and calcining equipment used for all Celite grades.



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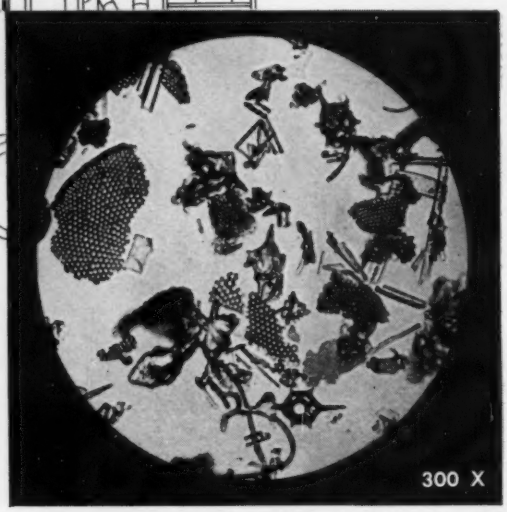

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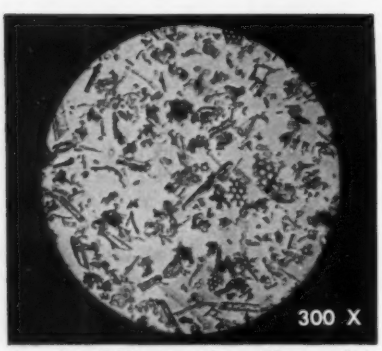
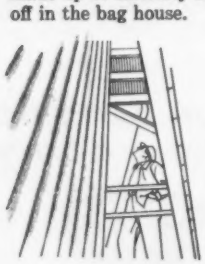
Constant uniformity in every grade of Celite assures consistent results, less down-time



For mineral filler use—Super Floss grade is made up of carefully sized fines air-floated off in the bag house.



Typical J-M bag house equipment.

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Super Floss, one of several bag house grades, has fine particle size distribution. A white powder, it is processed within very narrow tolerances (2-4 microns). It is a popular mineral filler in fine products such as silver polishes.

Johns-Manville can precision-produce so many different grades of Celite because it mines the material from the world's largest and purest commercially available deposit. For assistance with specific filtration or mineral filler problems, talk to a nearby Celite engineer. Or write direct to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE

Halogens Multiply Polyolefin Versatility

The recent debut of chlorinated polypropylene (CW Technology Newsletter, Jan. 21) highlights a continuing interest in halogenation of polyolefins to modify their physical and chemical properties, suit them to new uses (table).

In addition to Hercules Powder Co. —producer of the new polypropylene product — Enjay Chemical Co. and Germany's Farbwerke Hoechst have shown active interest in the field by bringing out new products in the past couple of years. Enjay's entry, called Butyl HT, is a chlorinated butyl rubber that's been on the market for several months after extensive development by Esso Research and Engineering Co. under the name MD-551 (*CW, July 23, '60, p. 35*). The Hoechst product, called Hostalit Z, is a mixture of chlorinated high-density polyethylene and polyvinyl chloride that the firm has sold commercially since '59.

Back in '54 Goodrich Chemical Co. introduced Hycar 2202, a brominated butyl rubber; and Du Pont's chlorosulfonated polyethylene, Hypalon, was marketed the year before. Older efforts include Imperial Chemical Industries' (London) Halothene, a chlorinated polyethylene brought out during World War II; I. G. Farben's prewar chlorinated polyvinyl chloride; and various kinds of chlorine-containing natural rubber.

Why Halogenate? Motivation for companies to halogenate materials that are already commercial falls into two categories: (1) altering of physical properties to expand the material's uses and (2) adding new chemical functionality to improve the curing characteristics of the polymer.

In general, halogenation of a polymer chain decreases the chain's regularity and, sometimes, its length. Hence a rigid, crystalline plastic can be converted into a rubberlike material. The exact nature of the change effected depends on the amount of halogen added (often 65% or more) and the conditions under which it is introduced, giving the producer the option of making a whole series of products using the same starting materials.

Halogen atoms attached to the polymer chain give new kinds of crosslinking sites, making possible the use of a greater variety of vulcanizing or curing agents. In the case of butyl, only 1-5% of halogen is enough to give the rubber completely new bonding characteristics without altering its desirable physical properties.

Chlorine Popular: Chlorine is the most commonly added halogen because it's cheap and because it can be added relatively easily without degrading the polymer. Bromine is used much less frequently (commercially only in the Goodrich product). Fluorine and iodine both tend to break down the polymer and are not now used as halogenating agents.

The alternative to adding halogen atoms to a polymer is, of course, building a polymer from halogenated monomers. In this way, such fluorinated polymers as Teflon and Kel-F are made. However, since every monomer molecule contains the halogen, the product contains a fixed amount of halogen. This makes the producer unable to vary the amount of halogen to obtain specific properties.

Question of Economics: Since chlorinated natural rubber has been a commercial product for many years (e.g., Hercules' Parlon), any new highly chlorinated elastomer with similar properties would have to compete with it. Hercules describes its chlorinated polypropylene, called Parlon P, as being similar to Parlon in many ways. Main uses for both are protective coatings, inks, adhesives, paper coatings and flame-retardant compounds. Main difference is price; Parlon sells for 60¢/lb., Parlon P for 58¢. The differences in properties noted by the company: Parlon has broader resin compatability (especially with alkyds) while Parlon P has better light- and heat-stability.

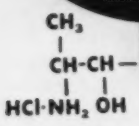
Similar competitive problems would face halogenated versions of any of the synthetic rubbers (e.g.,

Lineup of Halogenated Polyolefins

Polyolefin	*Chlorinated*	*Brominated*
Polyethylene	Du Pont's Hypalon: low-density PE subjected to simultaneous chlorosulfonation and chlorination — commercialized in '53 for highly stable rubber. Imperial Chemical Industries' Halothene: chlorinated low-density PE — commercialized in '40s for specialty coatings. Hoechst's Hostalit Z: mixture of polyvinyl chloride and chlorinated high-density PE—commercialized in '59 for a variety of PVC-type applications.	**None commercial; some lab work**
Polypropylene	Hercules' Parlon P: chlorinated isotactic polypropylene — newly commercialized for use in coatings, inks, adhesives, etc.	**None commercial**
Butyl rubber (copolymer of isobutylene and about 2% isoprene)	Enjay's Butyl HT: butyl rubber containing about 1.2% chlorine — commercialized in '60 as a rubber with good temperature resistance and compatibility with other rubbers.	**Goodrich Chemical's Hycar 2202: butyl rubber containing about 3-5% bromine —commercialized in '54 as an extra-fast-curing butyl that is compatible with other rubbers.**

PHENYL PROPANOLAMINE HYDROCHLORIDE

$C_9H_{13}NO.HCl$



SPECIFICATIONS

DESCRIPTION:
Clean, white, crystalline powder having a characteristic aromatic odor.

CHLORIDE ASSAY:
18.9–19.2% Cl
(equivalent to 99.8%–102% $C_9H_{13}NO.HCl$)

MELTING RANGE: 194–196° C

pH (3% aqueous): 4.2–5.5

RESIDUE ON IGNITION: 0.1% (max.)

MOISTURE: 0.5% (max.)

HEAVY METALS (as Pb):
0.005% (max.)

MESH: All passes No. 20

SOLUTION:
A 3% aqueous solution should be clear, colorless and practically free from fuzz, fibers and undissolved matter.

Commercial quantities promptly available from continuous production.

Samples on request.

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styrene - butadiene, polybutadiene, polyisoprene). A new product would have to match or improve on the properties of chlorinated natural rubber and would undoubtedly have to be less expensive. (Neoprene—a synthetic rubber made from a halogenated monomer, chloroprene — has properties quite different from chlorinated natural rubber.)

PE Modification: Chlorine modification of polyethylene has been tried for many years with recent attempts at some variations. ICI was first to offer chlorinated polyethylene with a low-density product in the '40s. Sales were never noteworthy, however, and the product was discontinued after the war. It was used mostly in marine and other coatings.

Du Pont also tested a chlorinated polyethylene around '50, but the product never got beyond the development stage. Main drawbacks were limitations on the types of polyethylene then available and that the product could not be vulcanized. (The company was interested in making an elastomer rather than a coating compound.) Addition of one more chemical group turned the trick, however, when Du Pont introduced chlorosulfonated polyethylene in '53. The sulfonyl group gave the material the needed cross-linking "handles," while the chlorine (boosted in content by simultaneous chlorination) performs the job of "rubberizing" the material.

High-Density Product: The advent of high-density polyethylene gave the industry a new material to chlorinate, and Hoechst's Hostalit Z is the first entry in this field. This material described as an "impact-resistant polyvinyl chloride" is actually a mixture of PVC and chlorinated Ziegler-type polyethylene. Mixed in different proportions, these two ingredients can give a highly flexible or a rigid product. Hostalit Z is described as being "somewhat higher" in price than either of its two constituents; its advantages include elimination of plasticizer, lack of volatile ingredients, good elasticity and a wide working temperature range, with especially good impact strength at low temperatures.

Hoechst has also patented halogenated and sulfohalogenated Ziegler polymers for use in lacquers (British 855,714).

Work on chlorinating high-density polyethylene is being carried on in this country by Phillips Chemical Co., Allied Chemical Corp. and others.

Chlorinated PVC: In the early '30s, Germany's I.G. Farben brought out Pe-Ce, a fiber made from chlorinated polyvinyl chloride (an olefin with chlorine added both before and after polymerization. The fiber died out when the newer synthetic fibers were developed, but small amounts of the compound are still made in Germany by Dynamit Nobel AG. for use in adhesives.

Goodrich Chemical is also interested in chlorinated PVC, is holding an Australian patent application (52,-595/59) on a heat-stable version of the material.

Butyl Entries: Both Goodrich and Enjay claim similar advantages for their halogenated butyl rubbers: faster cures and compatibility with other synthetics and with natural rubber. Enjay is promoting its product particularly for high-temperature uses (e.g., conveyor belts).

More new products are undoubtedly on the way, as many labs continue to study the properties of halogenated polyolefins. As the competitive push to modify and improve existing polymers increases, halogenation is a good bet to be a much-tried treatment.

Another Optical Maser

Another entry in the growing list of optical masers was demonstrated last week by Bell Telephone Laboratories (New York). Materials used were mixed helium and neon, making this the first gaseous optical maser.

It is also the first to exhibit continuous generation of coherent light waves (actually in the infrared region). International Business Machines (New York) had previously disclosed (*CW Technology Newsletter, Dec. 21, '60*) the development of solid-state masers (uranium- and samarium-doped calcium fluoride) that could theoretically be operated continuously, but the company has yet to achieve this type of operation.

Earlier, both Bell and Hughes Aircraft had demonstrated ruby optical masers that generated coherent light in very short pulses. Power requirements were relatively high, though.

The new gaseous maser is activated by an electrical discharge, powered by less than 100 w. Output: about 0.01 w.

Said Gaspard de Coriolis: *"A particle which is subject to no forces in a rotating coordinate system experiences a radial acceleration and a tangential acceleration."*

It was around 1840 that Coriolis discovered what has since become known as the Coriolis Effect. He noticed objects above the earth tend to rotate relative to the earth's rotation . . . to the right in the northern hemisphere, to the left in the southern.

The Coriolis Effect is in force in outer space, too. If a space vehicle is rotated in order to establish artificial gravity, the necessarily short radius of the rotation causes a Coriolis force. This creates orientation problems for a human occupant. To eliminate this difficulty, a scientist at Lockheed Missiles and Space Division conceived the idea of connecting the vehicle to an auxiliary fuel tank by a half-mile-long cable. Thus, if the whole system is then rotated at a reduced speed around its center of mass gravity, the longer radius greatly minimizes the Coriolis force. Right now—on the drawing boards at Lockheed—is an enormously advanced space vehicle system which utilizes this concept, in addition to many others.

Fortunately, natural laws are about the only restrictions which circumscribe scientists and engineers at Lockheed Missiles and Space Division. The climate in Sunnyvale and Palo Alto, on the San Francisco Peninsula, is close to perfection. The creative atmosphere—the opportunity to work on such important projects as the DISCOVERER and MIDAS satellites, the POLARIS FBM, or even more advanced concepts such as the space system cited above—is the dream of the creative engineer.

Why not investigate future possibilities at Lockheed? Write Research and Development Staff, Dept. M-11B, 962 West El Camino Real, Sunnyvale, Calif. U.S. citizenship or existing Department of Defense industrial security clearance required.

Lockheed / **MISSILES AND SPACE DIVISION**

Systems Manager for the Navy POLARIS FBM and the Air Force AGENA Satellite in the DISCOVERER and MIDAS Programs

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CHEMICAL MATERIALS CATALOG Page 179

LUCIDOL DIVISION

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Enzyme Push

Future importance of enzymes in clinical diagnosis was highlighted at last week's three-day international conference on "Multiple Molecular Forms of Enzymes," sponsored by the New York Academy of Sciences.

Recent research has disclosed that apparently similar enzymes actually have structural differences, and that these differences are more widespread than previously known. Not only do different species vary in molecular form, but also certain enzymes have been found to differ within a given individual by cell and tissue origin.

It is this characteristic that makes the enzymes potentially valuable as diagnostic agents, since diseased tissues would produce a different enzyme pattern than would healthy ones. Considerable work is necessary in detecting, characterizing and separating these different forms. At the present, electrophoresis is one of the most valuable analytical techniques available.

EXPANSION

• Gulf Oil Corp. will move the facilities of its refinery technology laboratory at Girard Point, Pa., to its main technical center near Pittsburgh. Approximately 200 employees will be transferred to the new lab location, while 57 others will be transferred to Gulf's Girard Point refinery.

• Food Machinery & Chemical Corp. and U. S. Steel Corp. are now starting up their jointly owned experimental coke plant at Kemmerer, Wyo. The plant, with a capacity of 250 tons/day, will be used to extend tests being made on FMC's process to utilize low-grade Wyoming coal.

• Plastics Applicators, Inc. (Houston) has opened a new laboratory to carry on research to improve plastic coatings.

• General Electric Co.'s Metallurgical Products Dept. (Detroit) is stepping up its research effort, has appointed E. W. Goliber manager of a new group called hard metals research. The group will investigate new and improved hard materials, especially in the area of cemented carbide metallurgy.

• Harris Laboratories, Inc. is building a new laboratory building at its Lincoln, Neb., headquarters. Harris expects to add new specialized services this year in the fields of drug

research, agricultural product and by-product utilization and radioisotope facilities.

• Dow Chemical Co. has formed a new laboratory at Midland, Mich., to carry on research in instruments systems. The lab will serve all company personnel in problems relating to instruments and instrument applications.

PRODUCTS

Peptide Find: Regis Chemical Co. (1219 North Wells St., Chicago 10) now offers research quantities of synthetic homocarnosine (γ-aminobutyryl-L-histidine sulfate). Naturally occurring homocarnosine has recently been found in the human central nervous system.

•

Intermediate: Semicommercial N-methyl acetamide is now available from Aceto Chemical Co., Inc. (Flushing, N.Y.), as an intermediate in organic synthesis.

•

Cellulose Dissolver: Miles Chemical Co., division of Miles Laboratories, Inc. (Elkhart, Ind.), has developed a new cellulose enzyme, Takamine Cellulase 4000. Said to possess good stability and activity under a wide range of conditions, it hydrolyzes and depolymerizes cellulose and other β-glucosides. Paper, cotton, wood, soybean hulls, carboxymethyl cellulose, etc., are digested by the enzyme. Among suggested uses: in animal feeds, brewing, extraction of essential oils, and as a pharmaceutical to aid digestion.

•

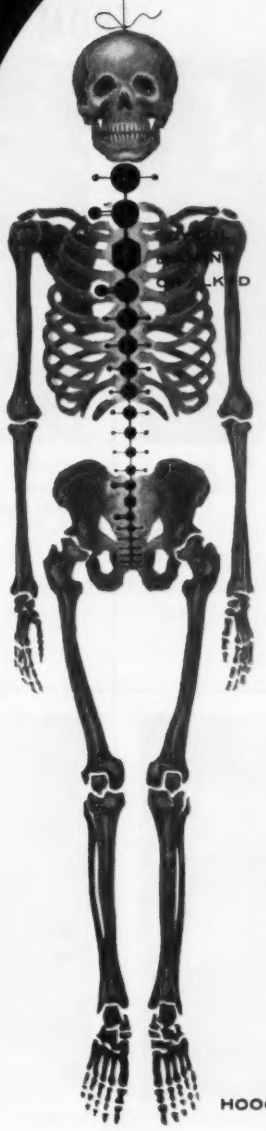
Laser Entry: Semi-Elements, Inc. (Saxonburg, Pa.), is now producing samarium-doped calcium fluoride for use as a laser (light amplifying) material. Single crystal ingots cost $225 each.

•

Heart Helper: Quinidine polygalacturonate (Cardioquin) is a new drug for treating cardiac arrhythmias. Manufacturer is The Purdue Frederick Co. (New York).

•

Petrochemicals: Cyclooctadiene, cyclooctene, and cyclooctane, are among the new family of eight-carbon chemicals developed by Cities Service Co. (New York). They're proposed as starting materials for adhesives, coatings, molded plastics and the like.



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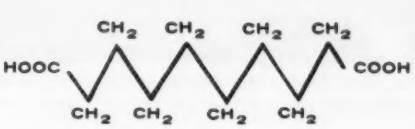
If there is a skeleton of a new product rattling around in your head, think of it in terms of Harchem Sebacic Acid. In many instances it has put meat on the bones of an idea and resulted in a highly salable product.



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Pages 159-161

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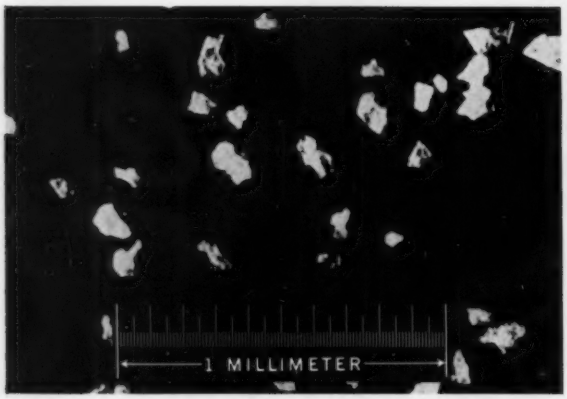
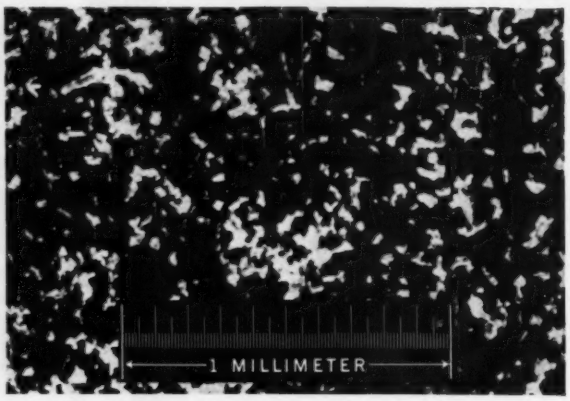


Sodium Bicarbonate U.S.P. Powdered No. 1—For general purpose use in chemical processing, dyestuffs, adhesives, starches, textiles and industrial applications.

TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

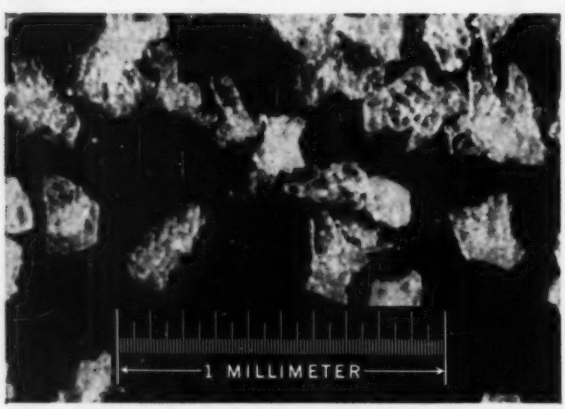
42 Mesh	Trace	200 Mesh	35.0%
100 Mesh	.5%	325 Mesh	70.0%
170 Mesh	20.0%	400 Mesh	80.0%



Sodium Bicarbonate U.S.P. Fine Powdered No. 3DF for use specifically in dry powder fire extinguisher mixes, also in rubber and plastics blowing, lubricant for sheet vinyl.

TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

170 Mesh	Trace	325 Mesh	25.0%
200 Mesh	2.0%	400 Mesh	45.0%



Sodium Bicarbonate U.S.P. Granular No. 5 for use in effervescent salts, other pharmaceuticals and special types of cleansers.

TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

42 Mesh	Trace	100 Mesh	92.5%
65 Mesh	27.0%	170 Mesh	99.0%
80 Mesh	66.5%		

Sodium Bicarbonate U.S.P. Treated Free-Flowing for use in fire extinguishers and sponge rubber.

TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

42 Mesh	Trace	200 Mesh	35.0%
100 Mesh	.5%	325 Mesh	70.0%
170 Mesh	20.0%	400 Mesh	80.0%

Are you getting Sodium Bicarbonate of the specific grain size for optimum results in your process or for maximum shelf life and performance of your products? You can eliminate doubts by specifying Church & Dwight. This simple step will assure you of obtaining the widest selection of grain sizes available because Church & Dwight is the country's largest supplier of Sodium Bicarbonate U.S.P. You'll also receive for the asking unmatched technical service based on more than 100 years of experience with Sodium Bicarbonate. Unusual grain size requirements are given special attention. Try us and see. For technical data on all grades of Sodium Bicarbonate, send for brochure, "Church & Dwight Sodium Bicarbonate—How It Serves Industry Today."

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Market Newsletter

CHEMICAL WEEK
February 11, 1961

Last weekend's hefty snowfall added another crushing blow to chemical marketing and distribution men already beset with serious delivery problems. Ice-choked rivers, clogged roads and snow-jammed rail lines have crippled movements of process materials in many areas of the North and East, have hampered deliveries in many others. Cost will probably be in the millions.

Many purchasing agents are worried about their operations, especially since inventories have been cut to drastically low levels in recent months. One Midwestern sulfuric acid plant almost shut down when a badly needed barge load of liquid sulfur was caught in an ice jam. Another plant nearly closed when a benzene barge got tied up near Cincinnati.

•

The long-delayed $2-million phosphoric acid plant of Bunker Hill Co. at Kellogg, Ida., is now starting its shakedown run, should be in production near the end of the month. Capacity: 130 tons/day of phosphoric acid (70% P_2O_5). The unit was completed last spring, but a 7½-month labor dispute (ending Dec. 21), plus recent bad weather, had held up operations. Initial production plans now call for three shifts to operate around the clock, seven days a week. Raw-material phosphate rock will come from southern Idaho mines, while sulfuric acid will be supplied by Bunker Hill's electrolytic zinc plant.

Meanwhile, Collier Carbon & Chemical Co. has completed its $225,000 anhydrous liquid phosphate plant (also at Kellogg), which is described by the industry as "an addition to Bunker Hill's phosphoric acid operations." Reason: Collier will use Bunker Hill's acid as feed stock for its own plant. But since the firm will have to wait for Bunker Hill to get into operation before it can start up, commercial production of anhydrous liquid phosphates probably won't begin until about the end of March.

The anhydrous liquid phosphate produced by Collier will be used in the manufacture of high-analysis fertilizers, then sold through the company's dealers and distributors in Washington, Oregon, California, Idaho and Arizona.

Recently, Central Farmers Fertilizer Co. resumed its phosphate operations in Idaho (*CW Market Newsletter, Feb. 4*).

•

In Florida, phosphates were also in the news this week. Davison Chemical Division of W. R. Grace completed extensive modernization and expansion of phosphate rock mining facilities at its Bonny Lake mine, at Ridgewood. (Recently, the company closed down its 40-year-old Pauway No. 4 mine near Lakeland.)

Market Newsletter

(Continued)

Despite a drop in output of U.S. synthetic fibers last year, production of noncellulosics (chemical fibers) continued its virtually uninterrupted rise—establishing another record—according to the Textile Economics Bureau, Inc. U.S. production of noncellulosic filaments and monofilaments totaled 437.3 million lbs., 6% more than the 412.1 million lbs. turned out in '59. Meanwhile, noncellulosic staple and tow were up 3% over '59, totaled 239.8 million lbs.

Production of rayon and acetate, however, dropped sharply last year, amounted to 1,028.5 million lbs., 12% under the '59's 1,166.8 million lbs.

Meanwhile, the bureau says that world output of rayon and acetate increased about 2% on preliminary estimates of 5,690 million lbs., compared with 5,560 million lbs. produced in '59.

•

The moving and storage business—possible new outlet for thermoplastic films? Moving companies are finding that they can cut down on labor expenses, build better customer satisfaction, reduce claims, by vacuum packing small items on fiberboard sheets (with an overwrapping sheet of film), then packing into cartons.

A special machine for this use is being offered by MFP Co. (division of Avery Industries, San Mateo, Calif.), which operates off ordinary house circuits and handles items from pins and needles up to 13 x 17 x 6 in. The company estimates that an average machine, which costs $995, will consume about 1,440 lbs./year of plastic film, plus 11,000 plastic-coated corrugated boards annually in the moving van operations.

•

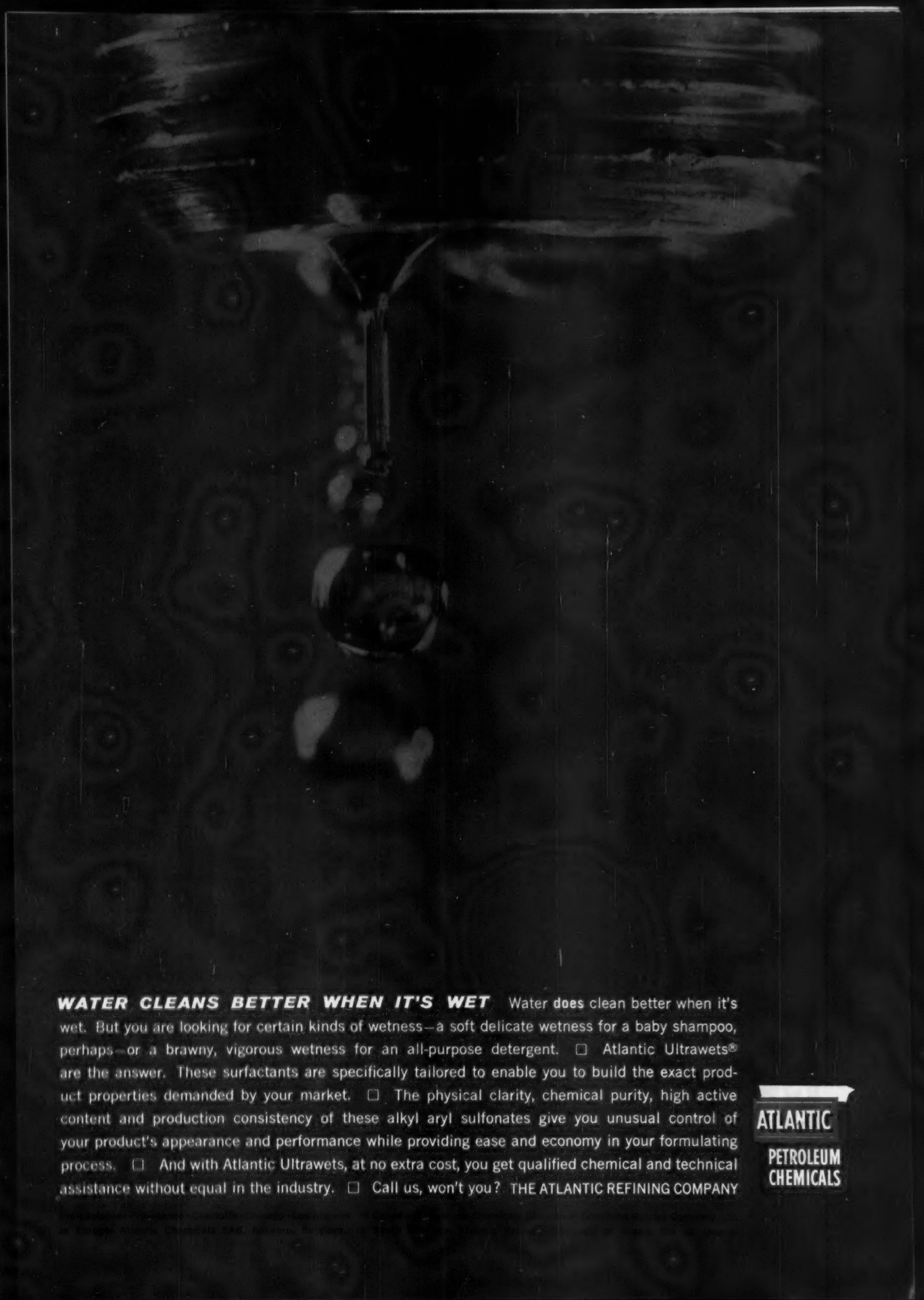
Shipments of Canadian sulfur (in all forms) totaled 1,002,000 short tons in '60, an increase of 15% over the 871,000 s.t. shipped in '59. Of this total 307,000 s.t. were elemental sulfur (from natural gas), a sharp increase over the '59 figure of 175,000 s.t. Of the remainder, about 60% came from pyrite and pyrrhotite; 40% from smelter gases.

The large gains are due mainly to better export markets. In '59 about 26,526 s.t. of sulfur were exported, nearly all of it to the U.S., compared with about 125-130,000 s.t. to the U.S. in '60. Most of this material was elemental sulfur from the natural gas fields of western Canada.

As for Canadian imports, an estimated 320-330,000 s.t. went to Canada from U.S. sources, plus material from Mexico.

•

A new half-million-dollar detinning plant has just been put into operation by Metal & Thermit Co. at Tampa, Fla. Two other plants are in the works. One will be opened in Hamilton, Ont., later this year, and the site for M&T's eighth plant is in the Portland, Ore., area (*CW Business Newsletter, Jan. 28*). Part of the output from these units will be used by M&T to produce its own line of tin chemicals. Meanwhile, commercial shipments of triphenylphosphorus are now being offered by the firm from its Rahway, N. J., chemical operations.



WATER CLEANS BETTER WHEN IT'S WET Water **does** clean better when it's wet. But you are looking for certain kinds of wetness—a soft delicate wetness for a baby shampoo, perhaps—or a brawny, vigorous wetness for an all-purpose detergent. ☐ Atlantic Ultrawets® are the answer. These surfactants are specifically tailored to enable you to build the exact product properties demanded by your market. ☐ The physical clarity, chemical purity, high active content and production consistency of these alkyl aryl sulfonates give you unusual control of your product's appearance and performance while providing ease and economy in your formulating process. ☐ And with Atlantic Ultrawets, at no extra cost, you get qualified chemical and technical assistance without equal in the industry. ☐ Call us, won't you? THE ATLANTIC REFINING COMPANY

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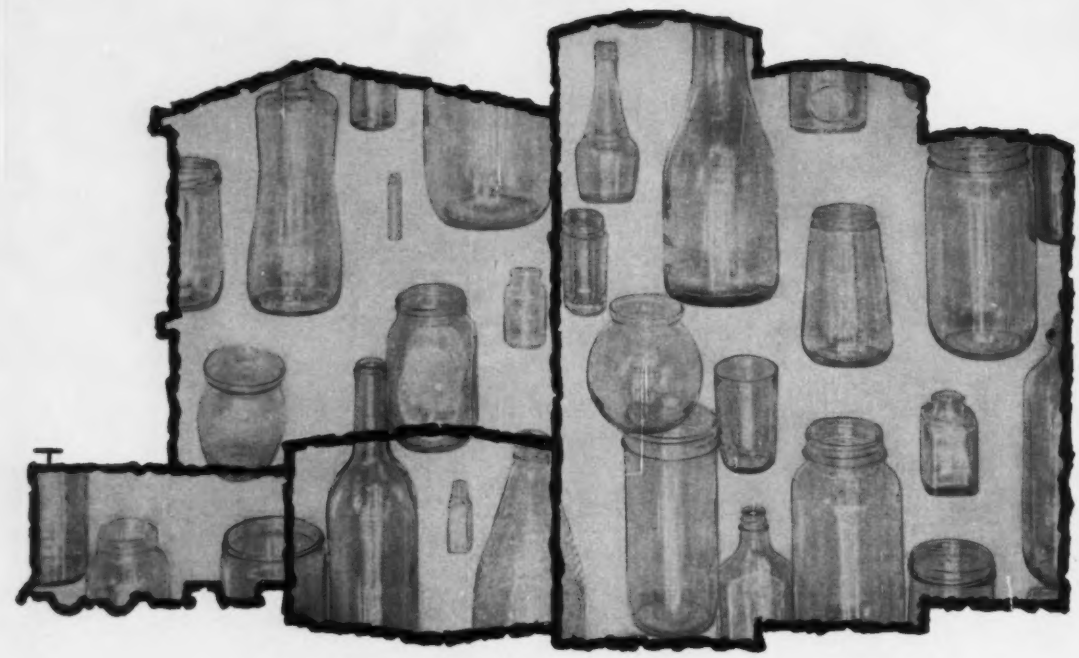
advance planning OF EXPANDED SODA ASH PRODUCTION ANTICIPATES INDUSTRY'S GROWING NEEDS



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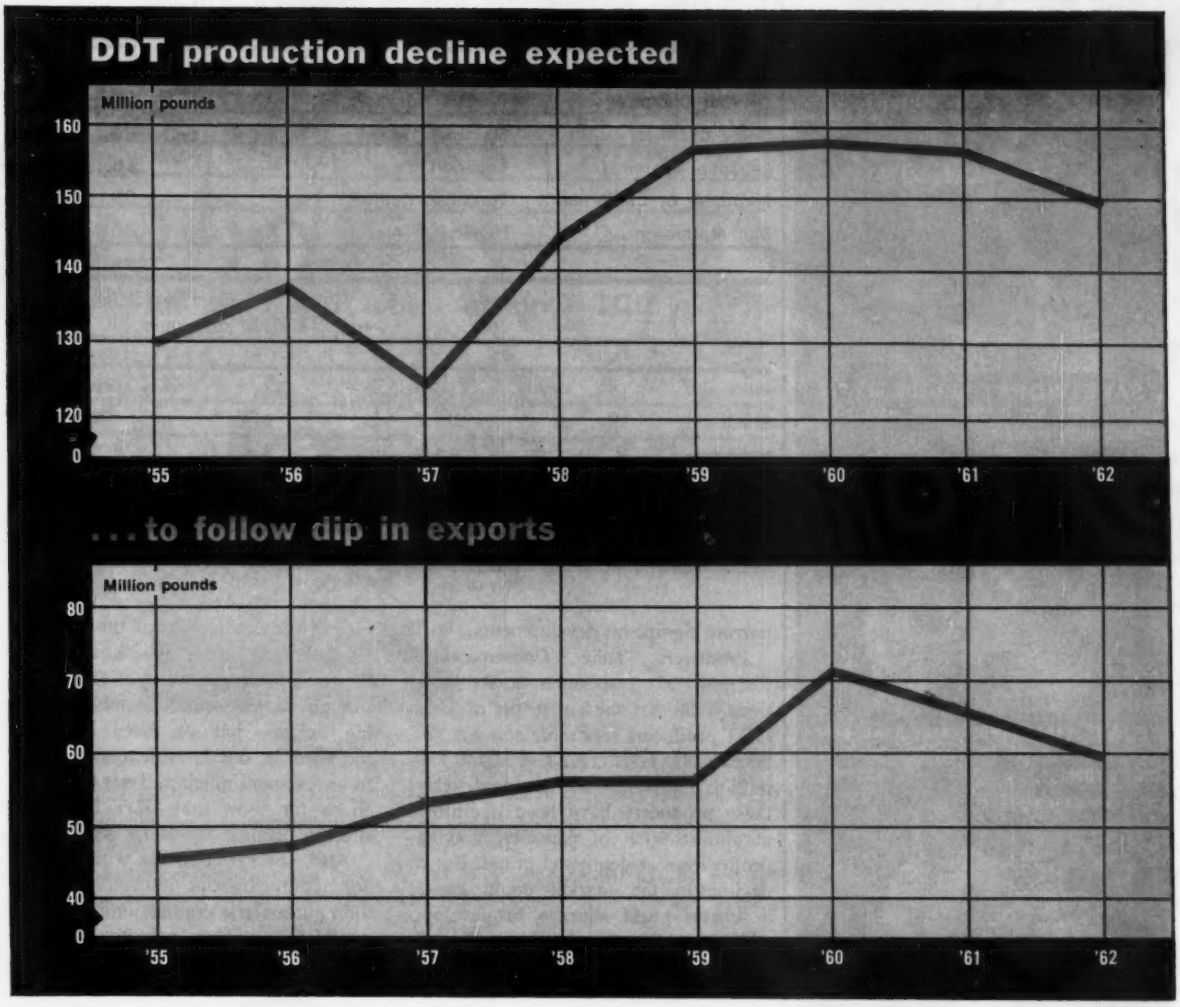

Uncertainty Darkens DDT Outlook Past '62

Although output of DDT in the U.S. has risen in the past five years (*chart above*), prospects beyond '62 are not so bright. Domestic consumption will probably continue at its current pace after '62, but exports — which have grown increasingly important in recent years—are expected to slump. Reason: large DDT-using malaria eradication programs in some foreign countries are nearing completion. The result could spell slow days ahead for U.S. producers.

Total U.S. production of DDT (dichlorodiphenyl trichloroethane) grew from 130 million lbs.* in '55 to 158 million lbs. in '60. Outlook: 157-million-lbs. production this year, 150 million lbs. in '62, and less thereafter.

DDT finds sizable agricultural applications in this country as a pesticide on cotton, fruits and vegetables. Consumption has remained at about 90 million lbs./year during the past five years, and no new developments or applications are expected to come along to bolster domestic use.

Unlike the stable domestic market, however, growing exports took 72 million lbs., in '60—46% of the total output, an increase of 26 million lbs. over '55's exports of 46 million lbs. Most of these exports—over 90%—went into malaria eradication programs throughout the world.

India took the lion's share in '60, about 38 million lbs., 55%. But the Indian malaria program is nearing its final stage, so by '62 India's requirements could drop to as much as half of current requirements, perhaps disappear completely by the end of '64. (Malaria eradication programs, when properly conducted, require only four to five years of residual spraying.) Moreover, malaria eradication programs in Ceylon, Taiwan, Jamaica, Honduras and several other countries should be completed about the same time.

As a result DDT exports in '61 will likely slip to 67 million lbs., and shrink further in '62, to about 60 million lbs.,

* All data is on the basis of 100% DDT.

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SAVE TIME! Pull Liner down over mandril. Then zip off quickly, cleanly at perforation!
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Kenilworth, N.J.

DDT Producers and Estimated Capacities

Company	Location	Million pounds
Diamond Alkali	Houston, Tex.	28
General Chemical	Marcus Hook, Pa.	20
Geigy Chemical	McIntosh, Ala.	20
Lebanon Chemical	Lebanon, Pa.	15
Montrose of California	Torrance, Calif.	65
Olin Mathieson	Huntsville, Ala.	30
	Total	178

DDT Exports Under ICA Program

(Million pounds; 100% DDT)

	'57-'58	'58-'59	'59-'60
India	16.5	23	38.3
Brazil	.8	1.5	2.9
Indonesia	2.2	2.6	3.5
Colombia	1.1	.7	1.1
Other	1.0	1.9	5.0
Total	21.6	29.7	50.8

barring significant developments.

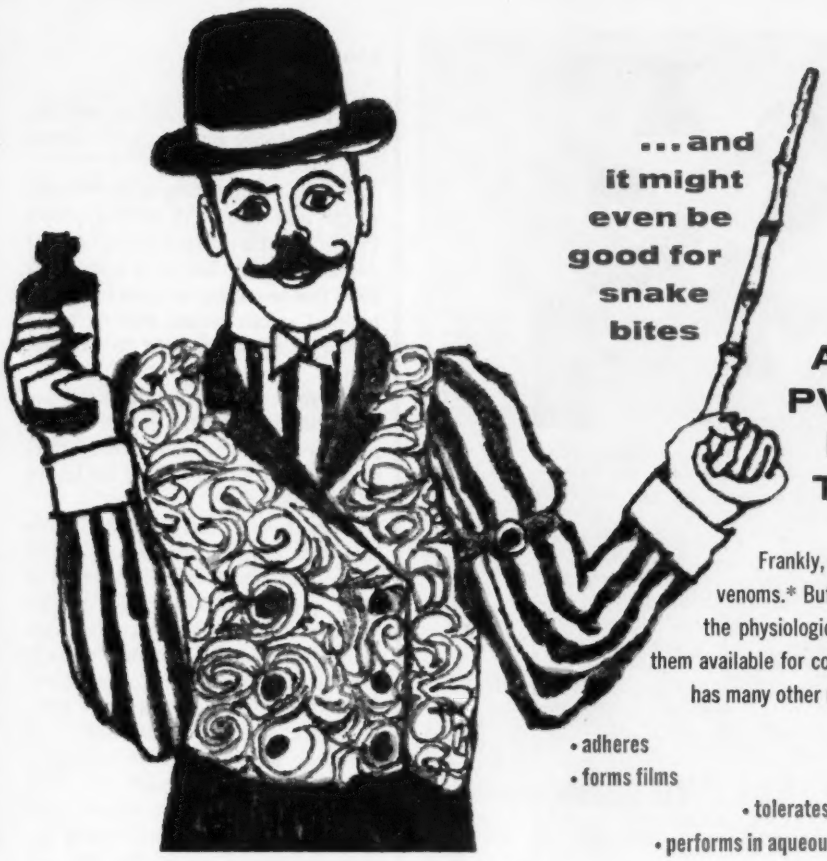
Producers Take Consequences: Currently six companies at six locations make up the entire list of U.S. DDT producers (*see table above*). Total capacity is estimated at about 178 million lbs. Over the last few years these producers have been operating at almost 90% of capacity, making profits even at depressed prices. But a decline in the market could cause a serious profit squeeze to develop, which could again shrink the list of manufacturers. At one time, there were 16 U.S. producers of DDT. But the combination of dwindling prices and demand has cut the list sharply.

In addition, foreign producers are appearing on the scene. Production units are operating in a number of countries, including India, Pakistan, Egypt, Italy, West Germany and East Germany. It's unlikely, however, that U.S. producers will have any serious trouble maintaining their tight grip in supplying DDT for world malaria eradication programs, since most of the material is purchased by the U.S. government's General Services Administration. And now, with the current government policy restricting the outflow of U.S. dollars, it appears that domestic companies will continue to receive preferential considerations.

Possible Prospects: Although the immediate outlook for DDT is dim, several projects are under way that could help bolster long-term prospects. Use in the eradication of the African tsetse fly-borne sleeping sickness could require sizable quantities of DDT. Although no program to combat sleeping sickness has yet been initiated, the need for one is evident, according to government officials. Tests conducted so far show that DDT is highly effective against the tsetse fly.

Also, several countries with a total population of about 400 million, may soon put malaria eradication programs into high gear. They include:

- Pakistan (population of about 80 million) where plans are still in the preparatory stage. A survey is in progress by the United Nations' World Health Organization to determine the extent of the malaria problem there. The Pakistan government hopes to get the program under way soon, but it will probably be slow in starting and likely to last 10 years.
- Indonesia (population of about 80 million), which has a limited anti-malaria program (for only about 7 million people). In a year or two its efforts will likely be expanded to cover the entire country.
- Africa (total population of about 200 million), potentially a substantial market for DDT. But malaria eradication on this continent is expected to move slowly because of the many countries and internal conflicts involved. By '63 only a partial program will be in effect.
- Haiti (population of 3 million),



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*The possibility of detoxifying snake venom has been suggested by Schubert, R.: Deut. med. Wochschr. **73**:551 (Nov. 19) 1948, and a statistically significant prolongation of survival time in mice injected with cobra venom and PVP has been demonstrated by Trethewie, E. R.: M. J. Australia **43**:8 (July 7) 1956.

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now planning a fight against malaria; it will probably get a program started next year.

• Brazil (population of 64 million), where only about 33 million people live in malaria-infested areas. A very limited program has been under way for a few years; but as soon as Brazil's political smoke settles, malaria eradication there is expected to progress rapidly.

But since all these programs will not be in full effect by the end of '63, especially in Africa, their total requirements for DDT won't match the loss of India's market.

Nevertheless, there's little doubt that these programs will eventually be carried out, which will lend support to DDT producers. The U.S. Congress voted in '58 to support a worldwide malaria eradication program through '62. In all likelihood Congress will continue to financially support these programs. And so, undoubtedly, will President Kennedy; in his inaugural address last month he said: "To those peoples in the huts and villages over half the globe struggling to break the bonds of misery, we pledge our best efforts to help them help themselves."

Worldwide Activities: Four well-organized and well-coordinated agencies take an active part in designing and executing health programs, as well as supplying the necessary commodities for stamping out major worldwide diseases: the UN World Health Organization (WHO), the Pan American Health Organization (PAHO), the UN Children's Fund (UNICEF), and the U.S. State Dept.'s International Cooperation Administration (ICA).

During the past five years ICA has become extremely active in world malaria eradication programs — providing both technical assistance and supplies. According to D. R. Johnson, acting chief of ICA's malaria eradication branch, this agency now has programs under way in 24 countries (population totaling 600 million). During fiscal year '60 more than 50 million lbs. of DDT were purchased and exported by the General Services Administration as a result of ICA recommendations—30 million lbs. more than in '58.

Spotty History: So, while prospects may appear lean the DDT producers aren't likely to see the famine days of past years. For example, from a wartime peak output of 200 million lbs. in

'44, DDT production plummeted to 20 million lbs. in '48.

Now, with a stable domestic market and some antimalaria programs expected to continue over the next 10 years, or longer, it looks as if there will be at least a fair market for DDT producers.

MARKETPLACE

Government Bids: The U.S. Army is asking for bids on the following chemicals:

Herbicide (powder form) containing 80% minimum 3-(*p*-chlorophenyl)-1, 1-dimethylurea, remainder inert ingredients, 50-lbs. net contents per shipping container. Quantity: 75,000 lbs. Opening: Feb. 10, '61.

Sodium phosphate, tribasic, anhydrous, technical, powder or granular, Type 1, in accordance with Federal Specification O-S-642, w/Amendment, 2, dated March 5, '59, 100-lbs. net contents per exterior container. Quantity: 700,000 lbs. Opening: Feb. 13, '61.

Activated carbon, technical grade, in accordance with Specification MIL-C-506A dated Oct. 24, '56, and Amendment No. 1, dated April 23, '58; Bid A, 35,000 lbs.; alternate Bid A, 35,000 lbs.; and Bid B, 4,500 lbs. Total quantity: 74,500 lbs.

•

Minerals Report: The Bureau of Mines has just issued a survey report titled "World Mineral Production in 1959." It shows that the U.S. and other non-Communist countries outproduced the Communist bloc in the mining of minerals by a commanding margin in '59. The Communist countries led the world in output of only 10 minerals out of 50 for which figures were available.

•

White Polyethylene: Monsanto Chemical has introduced a 45% concentrate white polyethylene, which can be blended with any of the firm's polyethylene extrusion and film resins to suit specific end-use requirements. The product is designated Monsanto polyethylene 6407, is said to eliminate the need for maintaining large inventories of white polyethylene blends. The firm says the product is being used for packages where visibility is not needed and to upgrade such substrata as kraft board and paper, foil and cellophane.

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MIAK has a high toluene dilution ratio (4.1). Of even greater significance, however, is the low viscosity of MIAK/toluene-nitrocellulose solutions. As the graph at right indicates, the viscosity of such solutions is lower than that of 2-ethoxyethyl acetate/toluene or even methyl isobutyl ketone/toluene solutions.

With an evaporation rate of 0.55, MIAK is slow enough to provide excellent blush control, yet not so slow as to delay sanding and rubbing operations.

Another point. MIAK has a mild ester-like odor, much more pleasant than the characteristic odor of the higher ketone solvents.

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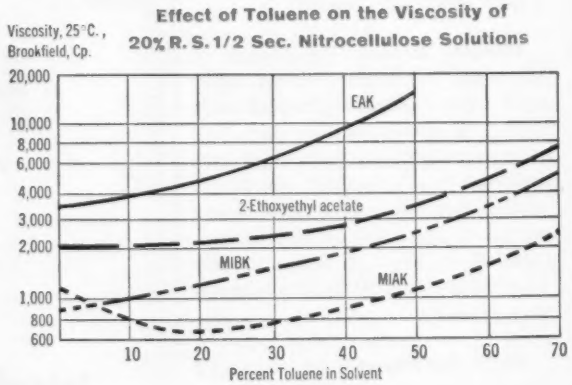
Comparison of Solvent Power of MIAK with Other Solvents

Viscosity, cps. @ 25° C.

Solvent	Evaporation Rate	10% ½ Sec.R.S. Nitrocellulose	10% Half-Second Butyrate	20% Acryloid B-82 Resin	20% VYHH Copolymer
MIBK	1.6	30	23	15	138
n-Butyl Acetate	1.0	44	36	26	GEL
MIAK	0.55	44	33	21	168
Ethyl Amyl Ketone	0.3	86	Ins.	28	286
2-Ethoxyethyl Acetate	0.2	122	68	50	Ins.

Effect of Toluene on the Viscosity of 20% R. S. 1/2 Sec. Nitrocellulose Solutions



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La Maur Wins Round One in PVP Battle

In a Minnesota court last week La Maur, Inc. (Minneapolis), maker of hair sprays and cosmetics, won the first round of an important battle—a U.S. district court upheld its patent (U.S. 2,871,161) covering the use of polyvinyl pyrrolidone, and a copolymer of PVP, in hair sprays.

The financial gist of the decision is that manufacturers of hair sprays using PVP or a copolymer (vinyl pyrrolidone-vinyl acetate) must pay royalties to La Maur. Most hair sprays now on the market fall into a class covered by the patent.

Principal defendant against La Maur was G. Barr & Co. (Chicago), big-volume contract filler for top-selling hair sprays sold by several firms, such as Max Factor, Toni and Colgate, which allegedly had infringed on La Maur's patent. George Barr, president of the firm, was still huddling with his attorneys this week to decide the details of his next move. However, he did tell CHEMICAL WEEK that "I will definitely appeal the decision" (*CW Business Newsletter, Feb. 4*).

The Court's Decisions: The main issues adjudicated in La Maur's favor include:

- The patent, owned by La Maur's President Maurice Spiegel, is novel and not based on art, known or anticipated, prior to the invention. Barr claimed that the patent was invalid because it was obvious to anyone skilled in the hair spray field at the time.
- The nine claims of the La Maur patent cover not only PVP but also certain copolymers of PVP—e.g., VP/VA. In a 27-page decision Judge Edward J. Devitt said that to rule otherwise would cause the inventor to restrict himself so narrowly as to invite imitation or else find his patent invalidated on grounds of indefiniteness.
- PVP and VP/VA are the same material. Vinyl acetate is "merely a dilutent or a minor modifier, not changing any of the properties essential so far as the patent is concerned."

Another point made by Judge Devitt (which might affect other products in the chemical field): "It is my view that the legal principle that covers dilution and minor modification by physical means should be likewise applied in the polymer field where the dilution and minor modification may be accomplished chemically."

Says the loser, G. Barr's Barr: 'I will definitely appeal the decision.'

Says the winner, La Maur's Spiegel: "I hope that the litigation is over."

Both sides called upon expert polymer chemists to back up their positions on whether PVP is essentially the same as its copolymer. Herman Mark of the Polytechnic Institute of Brooklyn and Edward J. Meehan of the University of Minnesota testified for La Maur, while Courtland Agre of Augsburg College in Minneapolis appeared for Barr.

Moving to License: In Minneapolis, La Maur's Spiegel, obviously elated by his victory, was preparing to arrange for licenses on his patent. Royalties had been fixed when the patent issued in Jan. '59, but now a new set of fees will be established.

Spiegel told *CW* that he hoped it would not be necessary to sue other hair-spray makers over patent infringement. "I hope the industry takes it to heart," he said, "and we won't have to litigate further."

Spiegel's prior attempt to issue licenses was unsuccessful. A few companies, notably Breck, took licenses, but most of the trade refused. Barr went so far as to indemnify his hair-spray customers against liability for infringement of the patent. As a result of his defeat, Barr must now pay a sum, which has yet to be decided by the court, for his clients.

No Secret Revealed: In addition to patent infringement La Maur's suit also charged Barr, a former filler for La Maur, with revealing a trade secret. On this count the court decided in Barr's favor.

Fate of PVP: When the controversy went to court last September there was a general feeling among hair-spray manufacturers using PVP that if La Maur won, they would switch to a substitute resin. Competitive materials, almost without exception, are less expensive than PVP.

However, it is reported that many of those who investigated or actually switched to a substitute have returned to using PVP and its copolymers because those materials produce a more effective product.

The question now facing most hair-spray makers is whether it is economically worthwhile to use PVP, paying its current price plus La Maur's royalty. It's quite possible that La Maur may set royalties low enough so that hair-spray producers will stick with PVP. In the meantime, of course, industry will be closely watching the outcome of Barr's appeal of the case.

HPF's Huplits: As his products move out, his franchises pay off.

The Royalty Road to Growth

A new aerosol starch will be introduced this month in two widely separated markets, the Ohio and the North Carolina areas. The new product, Easy Monday Spray-on Starch, will be made by similarly named but corporately separate companies, Blue Magic Co. of North Carolina and Blue Magic Co. of Ohio.

It will be the same product in every way but there won't be any lawsuits. Both companies are part of a fast-growing manufacturing franchise operation known as Household Products Franchisers (Fort Lauderdale, Fla.).

Though not unique in concept, Household Products Franchisers is probably the only company that offers a complete line of household specialty items. The company currently collects manufacturing royalties on a list of products, bearing the Easy Monday label, that includes such items as liquid starch, bleach, ammonia, all-purpose cleanser, pine oil disinfectant, floor cleaner, liquid detergent, and rinse aid.

National but Local: The franchising operation, in effect, allows a local manufacturer to stay local while making and selling a nationally distributed product. It's a neat operation from the licensor's standpoint since it provides income without capital investment or the wear and tear of actually operating a manufacturing business. Advantage from the licensee's standpoint (especially the small manufacturer): when a new product comes out, it can look to its licensor for a ready-made formula and process, bring it to market under a name that has widespread consumer exposure, even if the product sold under that name is not its own. In some respects, it's like a soft-drink bottling operation.

Simple Setup: Household Products' relationship to its licensees is quite simple. Basically, all that is required of the licensee is that he stay in his own territory and adhere to both the Household Products formula and process. Advertising, promotion and merchandising is pretty much left up to the licensee.

Royalties are paid on a per-gallon basis, but none is paid until the product is making a profit. The licensee is allowed to pack the Household Products items under his own private label if he so chooses, but royalties must be paid just as though the items were under the Easy Monday label.

W. H. Huplits Jr., partner in HPF, points out that there is some sales value in having a local manufacturer's name on the label; but more important, having plants near or in each market area cuts hauling costs. Since the Easy Monday products are heavy in weight but low in cost, freight savings are material.

Contrary to what some might suppose, group buying is not an important consideration in HPF's operation. Says Huplits, "We have found that about the only items that warrant cooperative buying among the plants are labels—and we have to buy these in quantities of at least 50 million sq. in. to get a good price.

Starts with Starch: Huplits, now 58, got into the franchise manufacturing operation by a somewhat circuitous route which had its beginning around 1944.

He was then an attorney in Philadelphia when a client induced him to become assistant to the president and manager of Candy Crafters, Inc., an East Lansdowne, Pa., firm. Shortly after making this move Huplits answered a *New York Times* ad seeking a manufacturer for a new product, a liquid starch. The man who placed the ad, the late Joseph S. Pecker, was a mechanical engineer who had helped develop the liquid starch formula and who owned the patent.

That same year — '44 — Candy Crafters entered into an agreement with Pecker whereby Candy Crafters was licensed in the U.S. to manufacture, on a royalty basis, liquid starch using the Pecker formula and process. The company then set up and sublicensed a subsidiary, Jiffy Products Inc., to do the job. Huplits was its vice-president, had a financial interest in this firm. The product was called Jiffy at first, but later, because of a name similarity problem, was switched to Zippy.

When the Jiffy Products majority stockholder died in '46, Huplits sold his stock in that company and set about developing his own liquid starch formula. This accomplished, Huplits established Household Products Franchisers in Philadelphia as owner of the new formula and process for liquid starch.

Magic Makers: First move of HPF was to set up and license Blue Magic Co. of Pennsylvania, Inc., in Ardmore to make its starch. Huplits and a Philadelphia businessman, Max M. Levy, were the principal stockholders. The Blue Magic name was intended

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Household products franchisers—What its licensees make

Plant	*Products*	*Main Territory*
Blue Magic Co. of New Jersey, Inc.* (Passaic, N.J.)	Liquid starch	Washington, D.C.; Northeastern states; west to Pennsylvania-Ohio line
Sun Products Corp. (Waco, Tex.)	Liquid starch (Miracle Rinse and All-Purpose Cleanser to be added soon)	Texas, Louisiana
Blue Magic Co. of North Carolina, Inc. (Wilson, N.C.)	Full line of Easy Monday products	Virginia, W. Virginia, Tennessee, south; west to Mississippi River.
Blue Magic Co. of Ohio, Inc. (Lima, O.)	Liquid Starch, All-Purpose Cleanser, Miracle Rinse (will add spray-on starch soon)	Ohio, Indiana, Illinois

*Formerly Blue Magic Co. of Pennsylvania (Philadelphia).

for the liquid starch, but a packaged desiccant used in the food industry already had that name. It was decided to retain Blue Magic for the manufacturing company itself and find another name for the product. Hence the name, Easy Monday. In '54 this operation was sold to J. L. Prescott, Passaic, N.J., where today it's operated as Blue Magic Co. of New Jersey.

Goes Nationwide: Once Blue Magic of Pennsylvania was off and running, Huplits turned his attention to franchises that would not require financial investment on his part. First came Sun Products Corp. (Waco, Tex.) in '47. This company was started for the purpose of making Easy Monday Liquid Starch. Huplits says it "now looks probable" that Sun Products will soon be making Easy Monday Miracle Rinse and All Purpose Cleanser. Next—in '53—came Blue Magic Co. of Ohio, Inc. (Lima, O.). This company makes three Easy Monday products—Liquid Starch, All Purpose Cleanser and Miracle Rinse. It will soon add Spray-on Starch.

The potentially lucrative Southeast was barely scratched by Easy Monday (sales around $200,000/year). Recognizing the potential, Huplits (and Levy, now a partner in HPF) decided in '53 to invest in a North Carolina operation, Blue Magic Co. of North Carolina, Inc. (Wilson, N.C.). This operation now accounts for more than $1 million of the over-$3-million annual Easy Monday sales. The plant (a converted tobacco warehouse and an adjacent cotton warehouse) has some 40,000 sq.ft. of production and storage area, has bottling equipment capable of turning out 4,000 dozen bottles in an eight-hour shift. A $75,000 expansion is underway to double the plant's capacity.

Alabama Bound: Currently, Household Products is considering granting a franchise in the Montgomery, Ala.,* area, and Huplits anticipates that when such an operation is started, it will turn out HPF's full line of 16 Easy Monday products (no plant other than Blue Magic Co. of North Carolina now makes the full line).

The only sections of the country where Easy Monday products are not sold are the Pacific Coast and Rocky Mountain areas. Though Huplits thinks he won't get into these parts within the next year or two, he says, "We do intend to cover them." As for his own company (Blue Magic of North Carolina), Huplits sees a 20% sales rise this year, expects to have two new items on the market, a liquid laundry detergent and a rust remover.

* A Florida company was licensed in '55 to make Easy Monday products, but its franchise was withdrawn last year. That plant was making starch, bleach, cleanser and ammonia.

More Dowgard Items

Dow Chemical Co. (Midland, Mich.) intends to capitalize on the name Dowgard, currently used only for its coolant. It's getting set to market a complete line of automotive chemicals under the Dowgard tradename.

First new product will be Dowgard Antifreeze, to be marketed this fall. A full-strength, single-phase type antifreeze with an ethylene glycol base, it will be recommended for one winter use only.

Although Dow has not reported other auto products that will go under the Dowgard banner, it is likely that radiator rust inhibitors, radiator cleaning compounds, multiphase polishes and engine tune-up chemicals are under consideration.

Perfume Vendor

A vending machine for dispensing miniature tubes of perfume is now marketed by Glamour Vending Corp. (Denver).

Each 50¢ cardboard tube holds five breakable plastic vials, each containing several drops of perfume. The scents are well-known brands, such as Schiaparelli's Shocking.

The vending machines, which offer six fragrance selections, are about the size of a postage-stamp machine. They are tamperproof and accept only 50¢ coins. Sold outright to franchised dealers, the vendors are being placed in California and Denver restaurants, bowling alleys, supermarkets and transportation terminals.

The perfume miniatures are supplied by Nips, Inc. (New York), are the same type that cosmetics manufacturers use for promotion.

Piston-Pumped Aerosol

Beecham Products, Inc. (Clifton, N.J.), is now test-marketing an aerosol version of its top-selling hair dressing, Brylcreem, plans national introduction in March or April.

The company's first aerosol product was briefly tested in the New York City-New Jersey area, is now being sold in Chicago. The 4.2-oz can is designed with the same red, white and silver colors used for tube Brylcreem. Retail price: 98¢.

Beecham delayed going into pressurized packaging, reluctant to put out

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2) Biology—the ability to recognize a splendid job or professional opportunity to pursue such opportunity with all speed and diligence.
3) Sometimes called the seventh or lucky (natural) sense.

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a product that would be diluted by the propellant. The new Brylcreem eliminates this problem by use of a polyethylene piston extending half the length of the can, preventing propellant and active ingredients from mixing. The can is filled from the bottom, using a conventional valve. Although piston-type aerosols have long been under trial, Brylcreem is reported to be the first commercial product to use them. They allow about 99% of the contents to be dispensed.

PRODUCTS

Pressured Adhesive: B. B. Chemical Co. (784 Memorial Dr., Cambridge, Mass.) has developed a push-button adhesive applicator for brush-on adhesives. The applicator, called Bostik Model B, feeds solvent and water-based adhesives through a flexible hose directly into the brush under factory air pressure. Tanks of 2- and 5-gal. capacity are available, and three outlets on the tank permit up to three 6-ft. hoses to work from one unit.

•

Foils Fumes: Metal & Thermit Corp. (Rahway, N.J.) is marketing a new series of fume-controlled chromium-plating compounds. The products, Unichrome SRHS CR-100F, CR-110F, CR-120F and CF-520F are supplied in pelletized form, contain chromic acid, a plating catalyst and a chemical fume suppressor.

•

Crabgrass Killer: Amchem Products, Inc. (Ambler, Pa.), has reformulated its No-Crab for more effective pre-emergence crabgrass control. The new product permits immediate reseeding after application, also kills crabgrass that has emerged up to 1 in. high. Available in dry formulation for treating over 2,500 sq.ft., a 12½-lb. bag sells for $10.95.

•

Cellophane Primer: The Borden Chemical Co. (New York) has developed a new prime-coat system designed to increase the adhesive properties of hot polyethylene extrusions to cellophane and foils. Borden's SO-242 is applied directly to the cellophane by wash coat prior to the extrusion and then air-dried. The product is clear and is easily diluted with ordinary isopropyl alcohol. It's available in 5-gal. cans and 55-gal. drums.

Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

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Mfrs. representatives calling on metal working plants, to handle new patented, low cost hard-facing processes in Central States. Advise lines carried and territory traveled. P.O. Box 192, Buchanan, Mich.

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Quality Control Manager—B.S., Chemistry, 9 years administration of control programs in chemicals, plastics (polyolefins), and explosives industries. PW-6094, Chemical Week.

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Purchasing Chemicals Dyestuffs 7 yrs. top ex- perience international multiplant organization $8,500—9,500. PW-6121, Chemical Week.

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BOOKS

Manual of Construction Management. For Chemical and Process Plant. National Schools of Construction. Publishers. Satsuma, Florida.

CONTRACT WORK WANTED

Custom Grinding . . . Pelletizing: Polyethylene, Polypropylene, Polystyrene, other thermoplastic materials. Film and sheeting scrap, lumps, filament waste, etc. Also air separation of sweepings & other contaminated molding powders. Equipment includes Sprout-Waldron Pelletizer, Cumberland Grinders, Air Table. Private RR siding. Plastics Reclaiming Corp., Tomkins Tidewater Terminal, South Kearney, N.J. MItchell 3-4145.

CONTRACT WORK WANTED

Processing Facilities Available—Southeastern States. Florida Food Plant, ideally located to serve rapidly growing South-Eastern market—has open processing time. Want contract packing, processing of food, drug, or cosmetic items. Have wide variety of Modern Stainless Steel Vessels, Pumps, Heat Exchangers, Low-temp and Quadruple-effect Evaporators, Homogenizers, Chillers; Direct-fired and Steam-heated Dryers, Hammer mills, Bagging Equipment: Can Filling and Closing Lines: Bulk container handling no problem. Large volume quick-freezing facilities. Dry, inside storage, and sub-zero warehouse available. Complete quality control and product development facilities. Approximately 10 acres adjoining land permits future expansion. Plant is staffed by high-calibre personnel, delivering quality workmanship. Plant has full rail sidings on major rail line, also on main truck route; deep water port nearby; our own truck fleet could be utilized. Sales Department willing to assist in marketing and distribution of food line items. Established marketing pattern of our own products could tie in with yours. Our busy season December to June, but some co-pack work could be scheduled even then. Your products, expansion plans, and needs may fit into this location. We will be pleased to give prompt, confidential consideration to all proposals. CWW-6025, Chemical Week.

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SPECIAL SERVICES

European market surveys, export, import con- tacts, investigation of European joint venture, licensing, acquisition opportunities. Consultant now in Europe, returning April. SS-6093, Chemical Week.

BUSINESS OPPORTUNITIES

Wanted to buy small established chemical com- pany—also interested in buying spin-off items. BO-5912, Chemical Week.

Integrated gas plant for production of high purity oxygen, hydrogen and nitrogen gases from distilled water. Capacity: 270 cu. ft. Per hr, hydrogen, 1375 cu. ft. pr. hr. oxygen, 1600 cu. ft. per hr. nitrogen. New 1955. Details on request. Joyce Equipment Co., Inc., 406-12 Ward Street, Chester, Penna. Phone: TRemont 4-8496.

Chemical Manufacturing, distribution or export- import business wanted for consolidation. Will retain personnel. Principles only. Replies held in strictest confidence. BO-6075, Chemical Week.

Patent for Sale or Licensing—novel asphalt additive. Principals only. BO-6100, Chemical. Week.

Wanted: An economic process to release Alumina from Alumina-Silica rock (Kyanite Ore). Very rewarding if you have such a workable method. Perhaps in your research efforts you have made a discovery which may be applicable to this problem. Write or phone Jay Kaufman, 480 Park Ave., N.Y. 22, N.Y. Tel. Plaza 2-0362.

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Chemical Engineer terminating operations of small organic chemical plant, seeks customer for his lab equipment, processes, and talents. BO-6107, Chemical Week.

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2750 gal. T316 Stainless tank, 7' x 8' dished heads, internal coils. Perry, 1415 N. 6th St., Phila. 22, Pa.

F.J. Stokes model #138J-16, 195 sq. ft. vacu- um shelf dryer, (16) shelf, single door. Perry, 1415 N. 6th St., Phila. 22, Pa.

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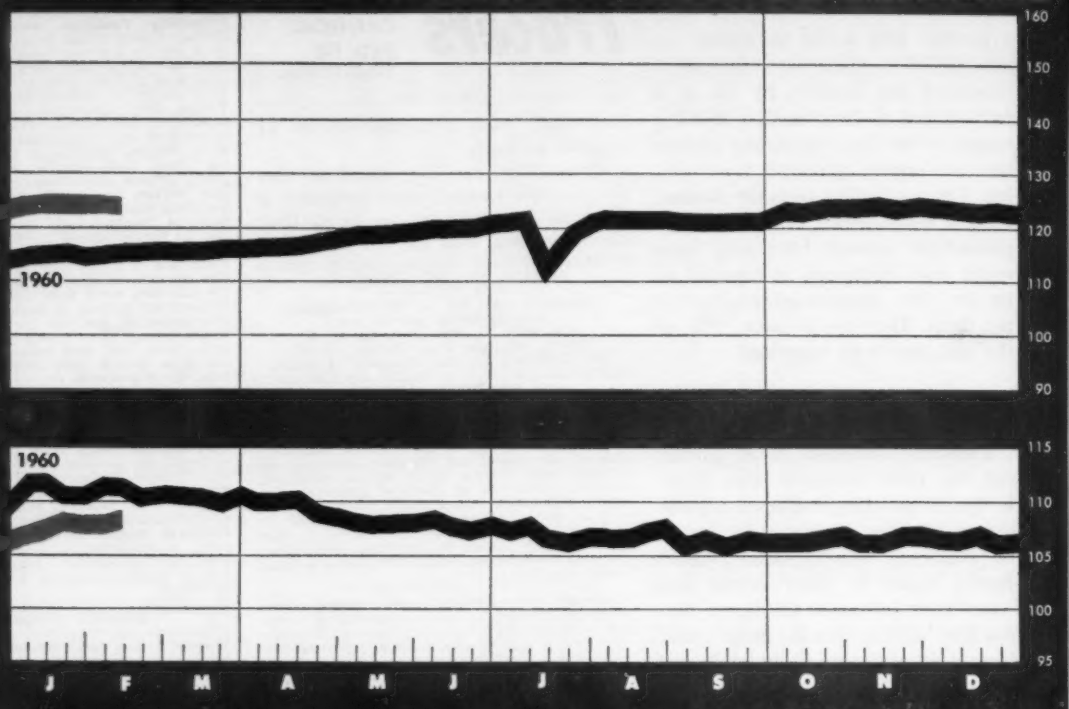

FEBRUARY 11, 1961

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	124.5	124.8	117.1
Chemical Week wholesale price index (1947=100)	108.9	108.1	112.1
Stock price index (12 firms, Standard & Poor's)	50.31	49.52	55.63
Steel ingot output (thousand tons)	1,466	1,499	2,717
Electric power (million kilowatt-hours)	15,361	14,817	14,417
Crude oil and condensate (daily av., thousand bbls.)	7,197	7,215	7,136

FOREIGN TRADE INDICATORS (million dollars)	EXPORTS			IMPORTS		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	132.9	144.8	109.9	24.6	29.0	25.6
Coal-tar products	14.6	13.7	7.3	4.8	4.8	4.1
Industrial chemicals	24.6	24.9	19.4	8.5	10.8	9.5
Medicinals and pharmaceuticals	22.0	24.3	21.6	2.5	1.9	2.1
Fertilizers and materials	7.7	14.0	7.1	5.6	7.7	7.2
Vegetable oils and fat (inedible)	13.1	5.1	9.7	5.1	6.1	7.3

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Cd **Cadmium Nitrate,** Crystal, Reagent and Purified Grades. Used in nickel-cadmium batteries, in manufacture of phosphors, in preparation of cadmium compounds and as a catalyst in preparation of organic compounds.

Cr **Chromium Nitrate,** Crystal, Reagent and Purified Grades; and Solution, Technical Grade. Used in nucleonics, metal finishing and manufacture of glue.

Cu **Cupric Nitrate,** Crystal, Reagent, A.C.S. and Purified Grades. Used as a mordant in dyeing textiles, as an ingredient in poultry remedy compounds, in preparation of highest purity cupric oxide for manufacture of catalysts, textile dyeing, metal finishing and various uses in the pharmaceutical industry.

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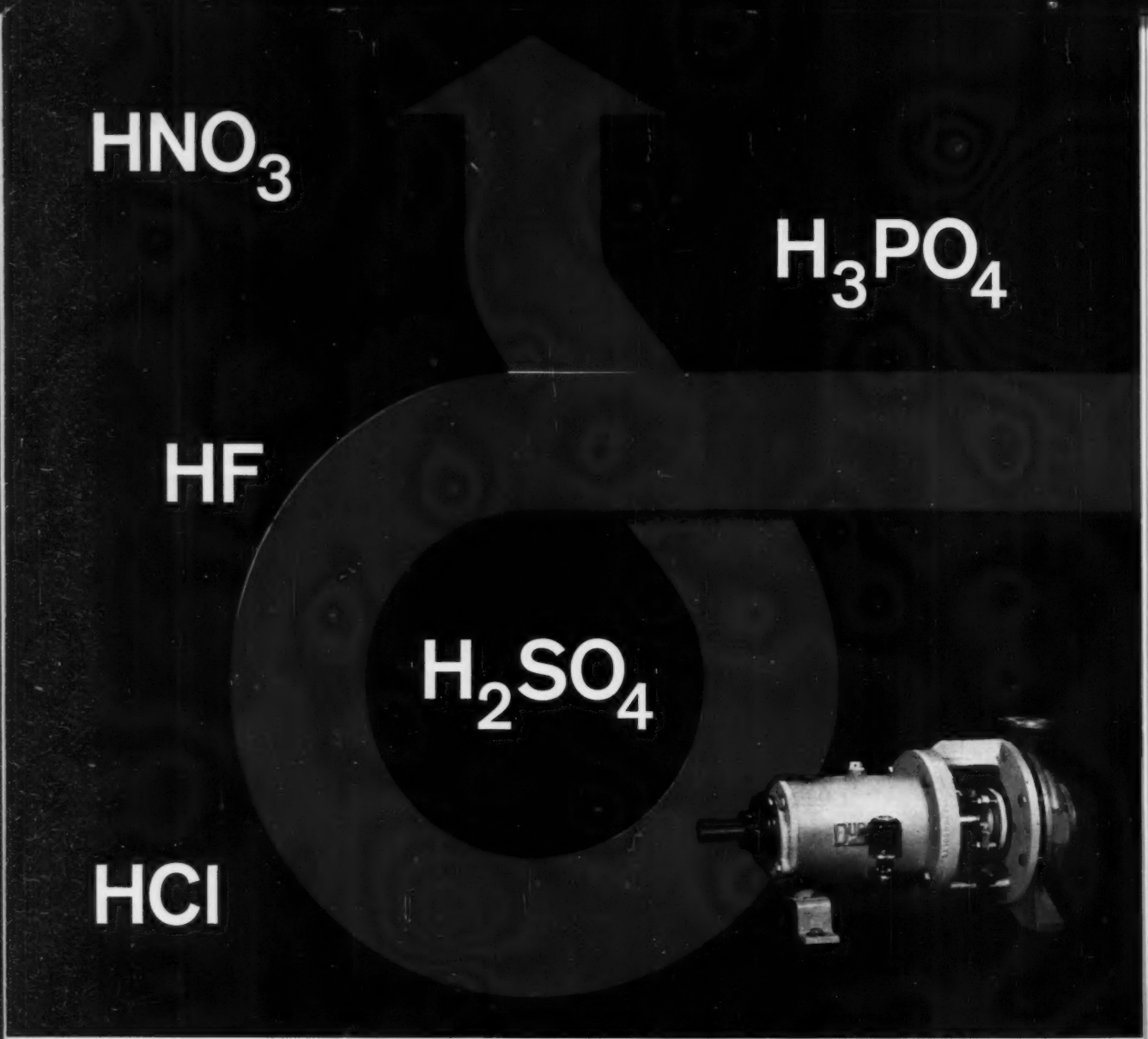

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